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Distribution of Wealth in the United States

Thorough-Going Analysis Shows the Fallacy of the Claim That
"the Rich" Two Per Cent Own 65 Per Cent of the
Country's Resources

BY DR. WALTER RENTON INGALLS*

THE spreading of the farmer-labor movement in the West and the ascendancy of Senator LaFollette and Senator Brookhart and others like them foreshadow attacks upon the corporations and wealthy persons of the United States in the next session of Congress. James A. Frear, a member of Congress from Wisconsin, stated the underlying idea in a recent newspaper interview, wherein he was represented as saying the following:

"Undistributed and unlimited profiteering has brought about an unhealthy economic condition when 2 per cent of the people in this country are found to own 65 per cent of all the wealth. . . . Millions of people who are scraping out a bare existence and fighting against a vicious sales tax urged by big business will approve any effort to curb these unconscionable profits."

Genesis of the Error

I do not criticize Mr. Frear, or any of the so-called radical Senators, for entertaining the belief that 65 per cent of the wealth of the United States is owned by 2 per cent of the people, for their belief is founded upon what appears to be good authority and is entertained by more scholarly persons than they. Prof. Homer Hoyt, in the quarterly of the American Statistical Association for March, 1923, discussed this sub-

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ject, drawing attention to the discrepancy between the bulk of the wealth being owned by the few and the bulk of the national income being shared by the many, the latter having been proved by the National Bureau of Economic Research in a way that has received common assent.

Professor Hoyt remarks that no one has reconciled these apparently conflicting statements and adds that as a matter of fact both of them are correct; following which he proceeds to try to prove that what seems to be a paradox really is not so. A simpler mind would not jump so quickly to the conclusion that both of these conflicting statements are correct, but rather would deduce that one of them is probably wrong, and knowing the nature of the work of the National Bureau of Economic Research on the national income would conjecture that the error is in the statement respecting the distribution of wealth.

The genesis of the latter statement is as follows: It appears in the "Final Report of the Commission on Industrial Relations" (Frank P. Walsh, chairman), published in 1915, wherein it is stated that "the 'rich,' 2 per cent of the people own 60 per cent¹ of the wealth."

¹ The agrarian Senators refer to 65 per cent of the national wealth being owned by "the rich." The Walsh committee says 60 per cent. Dr. King's original statement was that "more than half, in fact, almost three fifths of the property is possessed by this fiftieth part of the people." His statement, therefore, has been magnified in repetition, but we need not waste any space on this.

IS it true that 2 per cent of the people of the United States own 65 per cent of the country's wealth?

Dr. Ingalls shows in this article, which is the most thorough-going study of the subject that has yet been made, that statements that have been given wide currency, as to the concentration of property ownership, are not true. In his book of two years ago, "Wealth and Income of the American People," Dr. Ingalls made a careful analysis of the physical property in the United States. In this article the study is carried farther, with a view to disposing definitely of the fallacy which radical politicians have used so widely in stirring up discontent.

In the next twelve months the changes will be rung on the issue of unequal distribution of wealth, in the effort to array the house of "have not" against the house of "have." Dr. Ingalls' contribution to THE IRON AGE is thus a most valuable and timely document, and its conclusions should be widely disseminated.

Mr. Frear, Senator LaFollette and the rest of them therefore find their authority in the report of a Government commission duly transmitted to Congress. That commission was not, however, the original authority for the statement, but adopted it from the book on "The Wealth and Income of the People of the United States," by Dr. Willford I. King, whom the Walsh Commission correctly characterizes as a "statistician of conservative view."

Reference to the work of Dr. King will show that he did not make the statement in quite so positive a way as represented. However, it is unnecessary to split any fine hairs, for the same reference to the work of Dr. King will disclose also that he made his statements upon the strength of very inadequate data, which will not withstand critical analysis. I know that Dr. King himself agrees to this, for he informs me that he is "now in doubt as to whether the amount of wealth escaping probate is not so large as to cause a curve showing the distribution of estates probated to give a very erroneous impression concerning the distribution of wealth among decedents."²

We have here an instance of a great misconception that may lead to grievous political consequences. It is founded upon the unsupported statement of a single economist, made eight years ago when the data available were far less than what exist at present; a statement that, moreover, is based upon a method of computation whose very validity is challenged. It has been worth while to go into this explanation, even at the risk of being tedious, for if we are going to try to ascertain the truth it is desirable first to expose previous errors and misconceptions. This is, moreover, an excellent example of how unsupported statements are perpetuated, are incorporated and indorsed in Government reports, and become accepted as facts without anybody stopping to consider whether they really are so or not.

Inventory of the National Wealth

A study of the distribution of wealth in the United States will surely be complicated and probably more or less uncertain in its results. A method that immediately suggests itself is an analysis of the inventory of the national wealth. In my book on the "Wealth and Income of the American People" I offered such an inventory, expressed in terms of the dollar of 1913. My totals were higher than would be indicated from Census estimates for previous years, and I made it clear why the previous Census estimates are to be viewed as untrustworthy and should not be used in comparison with other estimates. I made my own estimates in great detail and was quite frank in explaining how I arrived at them. I am unaware of any serious criticisms of them. I feel justified, therefore, in assuming that my figures are nearly enough correct.

I estimated that the wealth of the United States at the end of 1920 was as follows:

Physical property in the United States.. 272.8 billion dollars
Foreign credit balance..... 17.8

Total..... 290.6

I expressed the opinion that the foreign credits are a doubtful asset. In so far as they are owed to the nation this will not enter extensively into a discussion of the distribution of wealth, for the loss, if there be any, will be spread over all classes of people. Any loss on commercial credits and foreign investments will fall, however, mainly upon the banks, corporations and investors. It may be remarked here that a considerable loss has already been sustained due to the extensive speculation in foreign currencies.

Wealth Classified

I divided my estimate of the physical wealth at the

² Dr. King's original deductions were drawn from an examination of probate records of Massachusetts and Wisconsin.

end of 1920 according to heads. A condensation thereof is as follows, in billions of dollars:

Owned by the people in common.....	17.125
Farms, live stock, etc.....	75.035
Houses in cities and towns.....	55.244
Other urban real estate.....	23.676
Factories, railroads, mines, etc.....	57.320
Furniture, clothing, jewelry, etc.....	15.900
Gold and silver bullion and coin.....	3.823
Automobiles	4.594
Ships, yachts, wharves, drydocks.....	1.063
Stocks of goods.....	19.000
Total	272.780

An itemization of the industrial property, including public utilities, as of the ends of 1916 and 1920, is as follows. It will be observed that in these estimates the value of the railroads of the United States is put at a much higher figure than was tentatively allowed by the Interstate Commerce Commission:

	1916	1920
Mines	\$3,880,000,000	\$3,269,000,000
Railroads, steam.....	24,500,000,000	25,500,000,000
Railroads, electric.....	5,361,734,000	4,000,000,000
Express companies.....	38,597,253	34,691,199
Manufacturing machinery and tools	14,500,000,000	15,500,000,000
Meat packing plants.....	250,000,000	350,000,000
Telephones and telegraphs....	1,475,000,000	1,800,000,000
Pullman cars	130,000,000	150,000,000
Tank cars.....	63,000,000	180,000,000
Petroleum pipe lines.....	400,000,000	608,000,000
Petroleum tankage.....	50,000,000	60,000,000
Light and power plants.....	2,900,000,000	4,058,000,000
Gas lighting plants.....	1,250,000,000	1,500,000,000
Water works, privately owned	300,000,000	310,000,000
Totals	\$55,098,331,253	\$57,319,691,199

Of the above enumerated wealth a good deal may be allocated as being of general ownership besides what has been so specified. Thus some of the gold and silver bullion is owned by every person who possesses gold and silver certificates, which he uses as currency. The wharves and dry docks are largely municipally owned. The estimate for the value of ships represents mainly the national fleet. There is certainly a wide distribution in the ownership of the automobiles, about one-third of which is ascribed to the farmers of the country. Also in the ownership of furniture, carriages, clothing and jewelry. Although the well-to-do possess a great deal more of those things per person their number is too small to enable their aggregate of such possessions to loom very big. The stocks of goods are owned partly by the producers of raw materials, including the farmers, partly by the manufacturers who fabricate them, and partly by the merchants, wholesale and retail, who distribute the finished products.

Ownership of Real Estate

The urban real estate, valued at \$78,920,000,000, represents about 20,000,000 houses and apartments, outside of the farms. It is well known that to a large extent the American people own their own homes. According to the last census 55 per cent of the families in the United States rented the houses in which they lived, while 45 per cent held title to them. Of the latter about five-eighths of them held their property free from encumbrance, while three-eighths held it subject to mortgage. These percentages are calculated upon all of the dwellings, including those on the farms; but we may apply them to the 20,000,000 urban dwellings without going far astray.

In my "Wealth and Income of the American People" I estimated the 20,000,000 houses and apartments available for use by people other than farmers in 1916 as being of an average value of \$2,880, including the land on which they stood, giving a grand total of 57.6 billion. My estimate for the value of other urban real estate was 24.7 billion. With the aid of the

Census figures we may proceed further with the analysis. Of the 57.6 billions in houses, about 31.6 was owned by landlords. Of the 26 billion remaining about three-eighths, or roughly 10 billion, was mortgaged. Inasmuch as mortgagees are generally indisposed to lend more than two-thirds the value of real estate, we may conjecture reasonably that the total of mortgages on the homes occupied by owners in the United States was about 6 2/3 billion dollars.

Farm Capital

Dr. L. C. Gray of the U. S. Department of Agriculture, at a meeting of the American Economic Association in December, 1922, presented a compilation and analysis of the wealth and indebtedness of the farmers of the United States. He estimated the total farm capital at about 95 billion dollars, of which he reckoned about 73 billion dollars as belonging to farmers who owed about 11 billion, making the net worth of the farmers proper about 62 billion. Dr. Gray estimated that nearly half of the total farm property not owned by farmers was held by retired farmers. It may be conjectured that the remaining ownership of farms is largely by local merchants and bankers. These data are not seriously out of tune with my own estimates.

It will be seen that Dr. Gray's estimate of the net worth of farmers is about 21 per cent of my estimate of the total national wealth, while his estimate of the farm capital is about one-third. This in itself is an important thing upon which to fix attention, for it is well known that the "rich" class that is especially the target for investive and taxation, is not in the habit of either investing in farms or lending money upon them. If 33 per cent of the wealth of the United States be in farm capital the "rich 2 per cent" of the people could not own 65 per cent of the wealth and leave anything for the millions of people other than themselves and the farmers, which result would be a *prima facie* absurdity.

Mortgages on Real Estate

Obviously this brings us right up to the consideration that the titular holders of the wealth of the United States may not actually own it free of claim by the money lenders. The farmers of the country do not own their farms in full. The townspeople who have title to their houses to a certain extent have only an equity in them. I have already estimated the mortgages on the latter class of property as amounting to about 6 2/3 billion dollars. According to the last census there were mortgages on about 40 per cent of the farms, aggregating about 8 billion dollars. It does not follow from this, however, that such claims appertain to "the rich." The greatest lenders of money to the farmers are the life insurance companies, whose assets are the combined property of many millions of policy holders. So it is with the mortgages on urban real estate, the money for which comes largely from the life insurance companies and the savings banks, wherefore the claim upon these forms of property rests among many millions of people.

Government, State and Other Bonds

Besides mortgages on real estate, claims on the physical wealth of the United States by others than the titular holders of the property are represented by Government bonds and notes, State, county and municipal bonds, corporate bonds, and notes for bank loans. The obligations of the Federal Government are, of course, collectible out of everything through the medium of taxation. The State, county and municipal bonds are in the same way first liens on all the property within the respective political subdivisions.

The public debt of the United States, June 30, 1922, was about 23 billion dollars, represented chiefly by

Liberty and Victory bonds. It was estimated by Treasury experts at that time that there were at least 10 million holders of these bonds. There were some concentrated holdings. Thus, at the end of 1922 the national banks owned 2 2/3 billions of United States securities. It is obvious, however, that upward of 10 million bond owners implies a wide distribution of this national claim upon the wealth of the country.

The total of State, county and municipal indebtedness in 1922 was about 8 billion dollars. These bonds are probably owned largely by the more wealthy class of investors.

Bank Loans and Investments

The total of loans and discounts by the national banks at the end of 1922 was 11,600 million dollars. These advances were to a large extent attributable to carrying the country's necessary stock of goods, both through the process of manufacture and through the period of sale. To a smaller extent they were loans to brokers and other persons on stocks and bonds. But here again it was not only the bankers' own money that was loaned. Rather was it, in the main, the aggregate of the deposits of a great many people.

It does not follow from the fact that certain interests are money lenders that the source of supply is a relatively few wealthy people. The greatest money lenders of all are the savings banks and the life insurance companies. At the middle of 1922 there were in American savings banks 26,637,831 accounts, aggregating \$18,087,493,000. At the end of 1920 the life insurance companies had assets of \$7,319,997,019, which was contingently the property of over 40,000,000 policy holders. Of this great fund 32.29 per cent was invested in mortgages, divided about half and half between farm mortgages and the other kind made up of city, building, home and industrial loans. About 26 per cent was invested in railroad bonds and stocks. Loans on policies amounted to \$820,000,000 and investments in Government bonds to \$772,000,000. The other investments were mainly in State, county and municipal bonds.

Indebtedness Among Ourselves

In all of these forms of investment—savings bank deposits, life insurance and Government bonds—there have been important increases since 1916. This does not reflect increase in the physical wealth, which, as I have shown in my book, did not occur in the period 1916-20 and to but relatively small extent in 1921-22. What it does show is a transfer of the claims upon the national wealth from one group of people to another, probably from a relatively small group to one that is very much larger. The last is indicated by the great increase in the number of savings bank accounts, Government bondholders, etc. The depletion of the smaller class is much greater than the transfer to the larger class, the difference being measured more or less by the decline in the national rate of saving from 15 per cent of the national income prewar to perhaps 7 or 8 per cent in 1920-22.

The main features of internal indebtedness, which represents claims upon the physical wealth of the country by others than the titular holders, may now be summarized as follows:

	Billions of Dollars
The national debt.....	23.0
State, county and municipal debts.....	8.0
Loans by national banks.....	11.6
Savings bank deposits.....	18.0
Life insurance assets.....	7.3
Total	67.9

The above summary omits obviously the claims of State banks and private persons. Conjecturally these

(Continued on page 915)

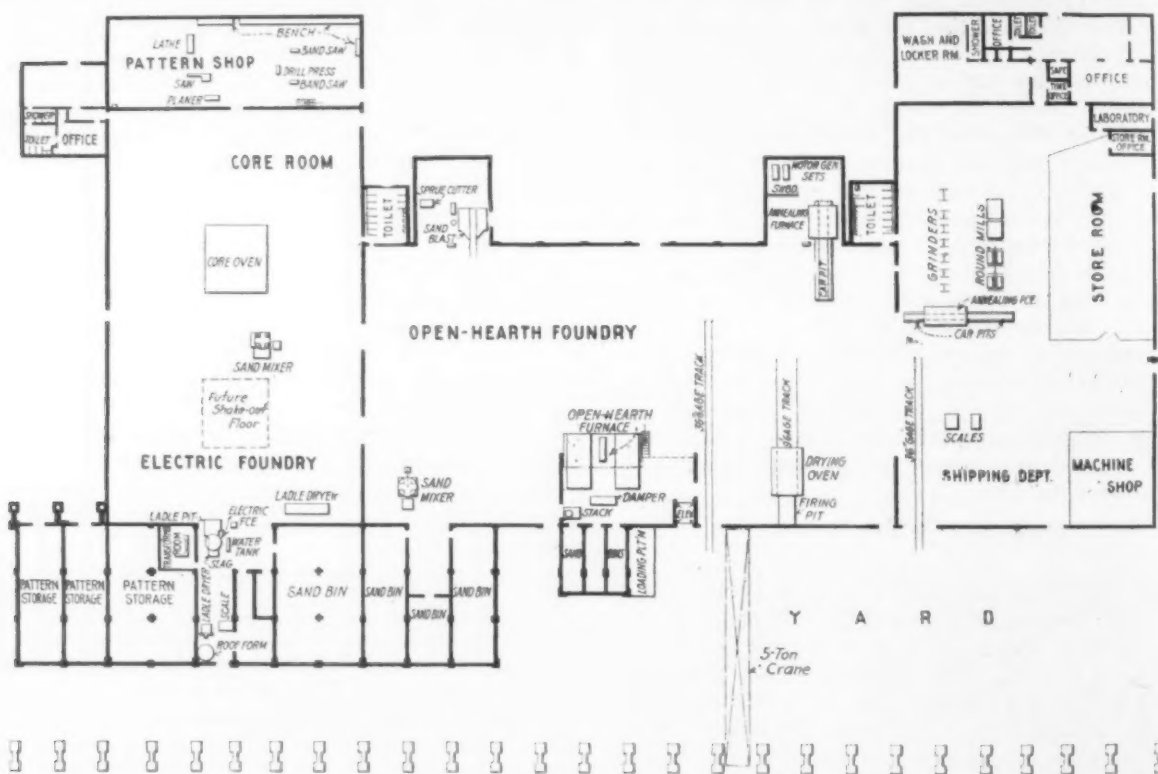
New Steel Jobbing Foundry

Plant of Eastern Steel Castings at Newark Uses Both Acid Open-Hearth and Electric Furnaces—Exceptional Light Conditions and Rugged Construction Feature the Building

HAVING completed its removal from the old plant at Bayonne, N. J., the Eastern Steel Castings now occupies a plant built in the closing days of the war for the National Brake Shoe & Foundry Co. at Avenue L and Edward Street, Newark, N. J., which was designed and constructed for the purpose of turning out automotive cylinder castings and similar work and built on a "cost plus" basis by James Stewart & Co., New York. The construction is exceptionally heavy and is of a character far superior to that customary in foundries, the walls being of heavily reinforced concrete with brick trim, while the roof of concrete tile is

bins, and the arrangement of a small annealing furnace operated with two cars.

Three heavily constructed reinforced concrete bins intended originally for sand, because of the large requirements of sand for core making in automotive cylinder practice, have been converted into a pattern storage through the simple expedient of closing permanently the openings in the roof through which sand was to have been delivered by the overhead crane from railroad cars, and erecting a heavy timber second floor about 8 ft. above the concrete base. An automatic sprinkler system for protection of these patterns from possible



Layout of the Plant of Eastern Steel Castings at Newark, N. J., Showing Arrangement of the Various Units. The three pattern storage rooms at left were converted from sand bins. The yard crane, with 95-ft. span, passes over the roof of the bins with enough headroom to deliver sand from a clamshell bucket through the roof scuttles

carried on steel frame construction. An unusual amount of light is available through both side windows and monitors.

Broadly speaking, there is a main building 120 x 472 ft., with extensions at right angles to the length at both ends on the one side and storage bins outside the main dimensions on the other side. The entire plant, except for the power house, is within the one building, which has an extreme length of 520 ft. with an extreme width of 266 ft. The center of the main structure houses the open-hearth foundry, with the electric foundry at one end and the shipping department at the other end. The pattern shop occupies the end of one of the wings at the electric foundry end of the plant, while the office and the men's locker room are located in the corresponding end of the other principal wing. Pattern storage and sand bins are in the wing back of the electric furnace, both being placed in the position designated for sand storage in the original layout of the plant.

Among the unusual features are the character of the pattern storage, the commodious sand bins, method of charging the electric furnace, command of the yard crane over both the stockyard and its siding and the

danger of fire is to be installed. The space devoted to pattern storage occupies an area of 60 x 80 ft. on each of the two floors, with a corner cut out for the transformer room for the electric furnace.

One of the sand bins remaining, and still used for that purpose, will, it is estimated, hold the contents of 37 cars of 50 tons each. The smaller bins have an aggregate capacity greater than this, so that the present sand storage capacity of all the bins approaches 5000 tons, for a plant with a present maximum capacity of 750 tons of castings per month. Sand is taken by clamshell bucket on the yard crane from railroad cars and dumped through scuttles in the roof of the sand bins, this roof being about 18 ft. above the ground.

The present battery of core ovens includes eight ovens in two rows of four, back to back, and using coke for fuel. Originally the equipment included another unit of this same size, the larger capacity for cores being required for the type of casting for which the plant was designed. Only half of the present equipment, however, is in steady use, and it is felt that these eight ovens will fill the needs of the plant for a long time. The pit where the other ovens were originally located is to be arranged eventually for sand reclama-



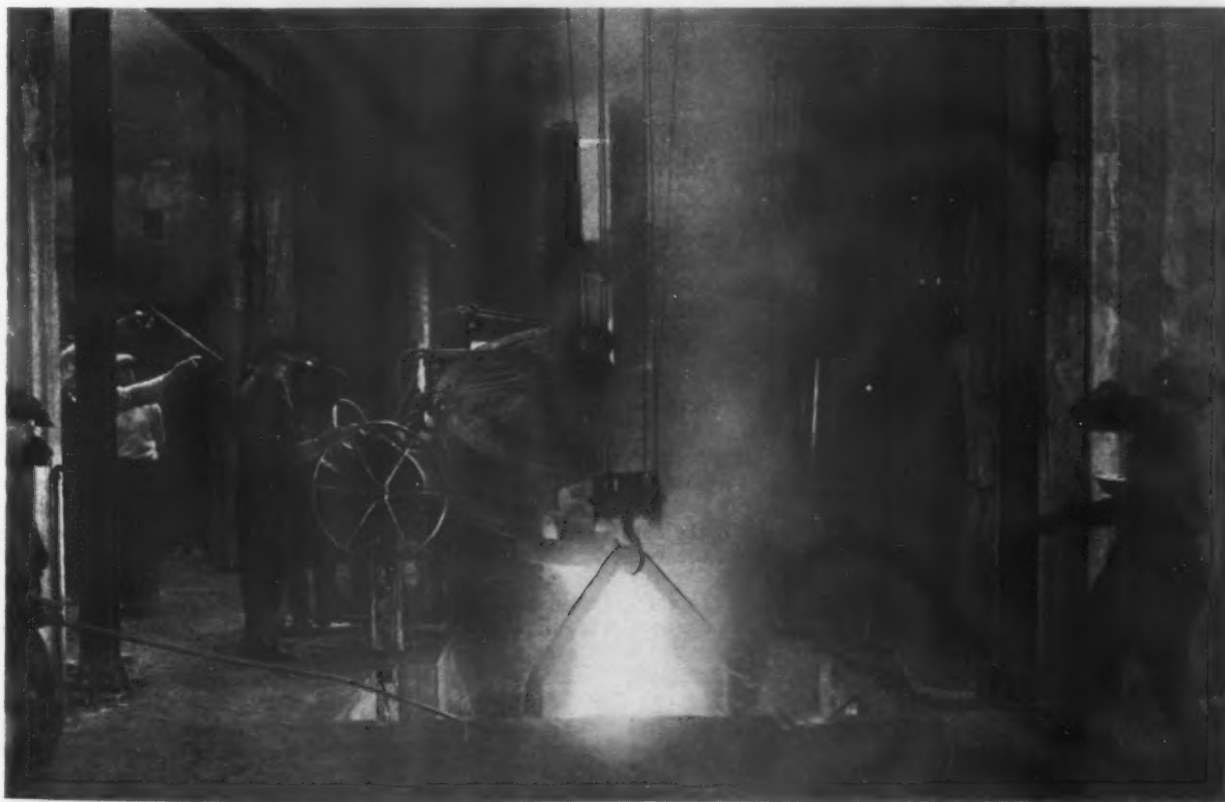
Car-Type Oil-Fired Annealing Furnace, Fired on One Side and Operated on the Semi-Muffle Principle. Easy operation of the door by hand wheel is shown. At right is a battery of bench grinders for cleaning castings

tion, the grating which is to cover it being utilized as a shake-out floor. As the plan shows, the core ovens and the future shake-out floor are located in front of the electric furnace. Reclaimed sand is mixed with new sand in the ratio of about 80 per cent of the former to 20 per cent of the latter.

There is one car type mold drying oven, measuring 12 x 16 ft.

Melting is accomplished in a 1½-ton Moore electric furnace furnished by the Pittsburgh Electric Furnace Corporation, which is capable of turning out a heat per hour melting from cold stock, and an 8-ton open-hearth

furnace with acid bottom, capable of turning out six heats per day, or one every 4 hr. It is possible to charge the electric furnace up to a maximum of 4 tons, or considerably more than double its normal capacity, while the open-hearth furnace also can be super-charged. No pig iron is used in the electric furnace charges, steel scrap only constituting the charge, with such ferro-alloy additions as may be necessary to complete the heat. For the open-hearth furnace not more than 10 per cent of pig iron is used, this being of low phosphorus grade. The usual charge carries between 8 and 10 per cent of pig iron. Much of the scrap used is of



Tapping the 1½-Ton Moore Electric Furnace. Scrap bins are at the rear (left), while the weighing scale and "sugar scoop" charging trough are directly behind the furnace (not visible here). The transformer room is behind the wall corner at right

high carbon; in particular a considerable quantity of shell steel still remaining from war operations is being melted here. Oil is used as open-hearth fuel.

Charging the electric furnace is done by means of a so-called sugar scoop about 10 ft. long and mounted on wheels. This is filled with scrap and weighed during the time the furnace is melting the preceding charge. It then is run into the charging door of the furnace and dumped by the simple expedient of lifting the rear end by means of an air hoist, or electric hoist, both being available at that part of the plant. Charging of the open-hearth furnace is by hand, there being two charging doors capable of taking pieces about 42 in. wide.

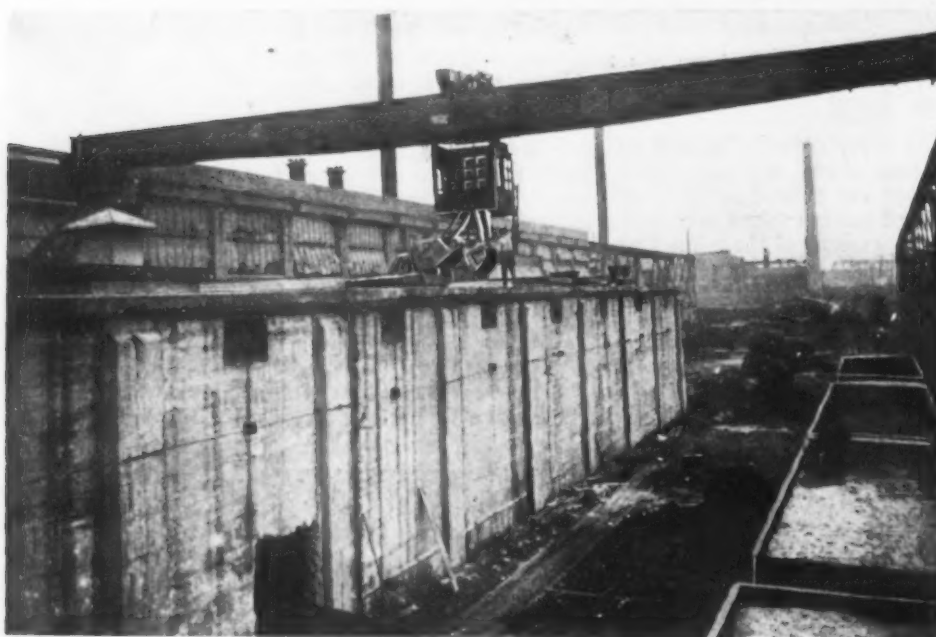
Product of the company consists wholly of castings ordered by outside customers. It includes particularly electric motor housings, headers for the tubes of water-tube boilers, parts for oil stills and other pieces of similar character, some of which have to withstand heavy pressures, while others such as the motor housings do not. The output includes castings varying all the way from $\frac{1}{2}$ lb. to 5 tons, though the great bulk of the sales consists in castings of less than 200 lb. each. All castings are annealed before shipment and, as many of them are made with large sink heads weighing frequently considerably more than the casting itself, a

the power required during the day will not be needed. It is believed that the added investment will be fully justified by the greater efficiency of operation thus provided. The two boilers of 450-hp. are fired with oil from six storage tanks in the yard, which have an aggregate capacity of about 8 cars. Each boiler has four oil burners; two furnish ample heat to maintain a steam pressure of 135 lb. under normal conditions; one is sufficient under light load.

Two air compressors made by the Chicago Pneumatic Tool Co. and operated by synchronous motors furnish an air pressure which is maintained at 90 lb. per sq. in. The two units are duplicates, with cylinders 17 and 10 x 12 in.

Water which is employed to cool the frame and doors of the open-hearth furnace is passed from that point to a Cochrane feed-water heater in the power house and given further heat from the steam engine exhaust before being fed to the boilers. Water which has been used for cooling purposes on the electric furnace goes to a sump, from which it is pumped to a rifle arrangement on the roof for cooling, whence it drains into a tank and then is circulated back around the furnace.

About 225 men are now employed, although for heavier production the plant might use 50 per cent more. They



With a 95-Ft. Span, the Yard Crane Extends Over Both the Spur Track and the Concrete Sand Bins. Sand, handled in a clam-shell bucket, is readily dumped through scuttles in the roof. Steel for the open-hearth furnace is handled by magnet, from this same crane, being dumped on a platform at the far end of the sand bin structure, whence it is moved by hand to the furnace charging floor on the same level with the platform

certain amount of work has to be done on each one, not only in cutting off the sprues and sink heads, but also in grinding off the burrs left by the sprue cutter. Some of the large risers are burned off, while swing-frame grinders are used to take off the burrs. Many of the castings are sand-blasted, while the smaller ones are run through tumblers after annealing, there being six of these tumblers located alongside the shipping department at the office end of the plant.

Two annealing furnaces take care of this special process, both having car pits. One furnace measures about 7 x 11 ft. inside, while the smaller one is $3\frac{1}{2}$ x 15 ft. This latter has two cars in a pit, which are run in and then sealed by clay after the doors at the two ends of the furnace are lowered upon the ends of the cars. A grating placed upon the cars, under the castings to be annealed, facilitates circulation by the heated gases, and causes the furnace to operate on the semi-muffled principle. Oil is used as fuel, with firing on one side.

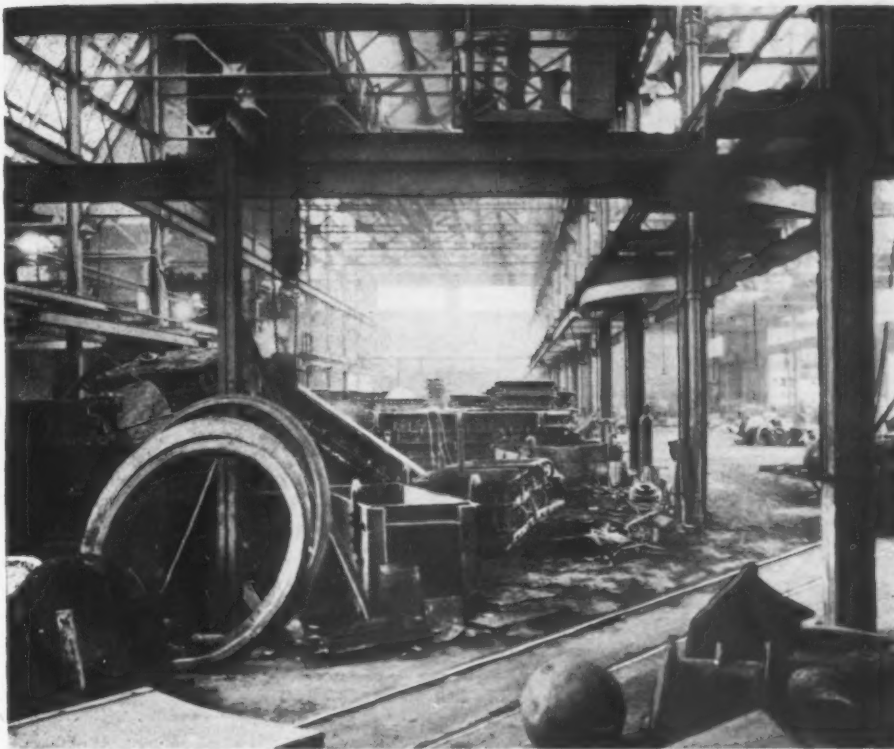
Power for the electric furnace, the yard crane and all the inside cranes, as well as for light and other purposes and for running air compressors, is furnished by a 450-kw. a. c. General Electric unit operated by a Unaflo engine of one cylinder built by the Skinner Engine Co. Arrangements are being made to install a second unit of 160 kw. for use at night, when much of

have a locker room unusually commodious and well provided with both light and ventilation. There are several showers and other accommodations for the men. *Esprit de corps* is helped by a production chart over the door leading from the foundry floor to the men's locker room. This shows, day by day, the output "this" month, compared with "last" month.

As the plant is a self-contained unit, it has the usual equipment of pattern-making machinery, sand mixers, overhead cranes, sand-blast equipment and a small machine shop, besides grinding benches and heavy grinding units at various locations through the foundry.

The 5-ton yard crane runs on trestle rails over the roof of the sand bins and along the edge of the main building, extending also over the spur tracks. The operator's cab is in the center of the 95 ft. span, giving him a view of all operations. In the foundry is a 10-ton overhead electric traveling crane, while an overhead hoist runway traverses the entire molding floor.

As originally designed, the plant had a cupola in the place now occupied by the open-hearth furnace. The charging platform for this cupola was at the level of the top of the sand bins and there was an elevator in one corner of the charging floor. This floor had to be lowered about 10 ft. to form a charging floor for the newly constructed open-hearth furnace, while a loading platform for scrap and other materials for the furnace



In Addition to the 10-Ton Crane Which Serves the Molding and Pouring Floor, a Monorail System With Hoists Extends Throughout This Section of the Plant. The roof structure with concrete tiling and good light may be noted from this illustration

was placed outside under the yard crane. Great difficulty was experienced in cutting through the concrete and steel members of the building in lowering the floor just mentioned, because of the very rugged construction adopted. This same difficulty was experienced also in cutting doorways through the reinforced concrete walls of the old sand bins in refitting these bins for storage of patterns.

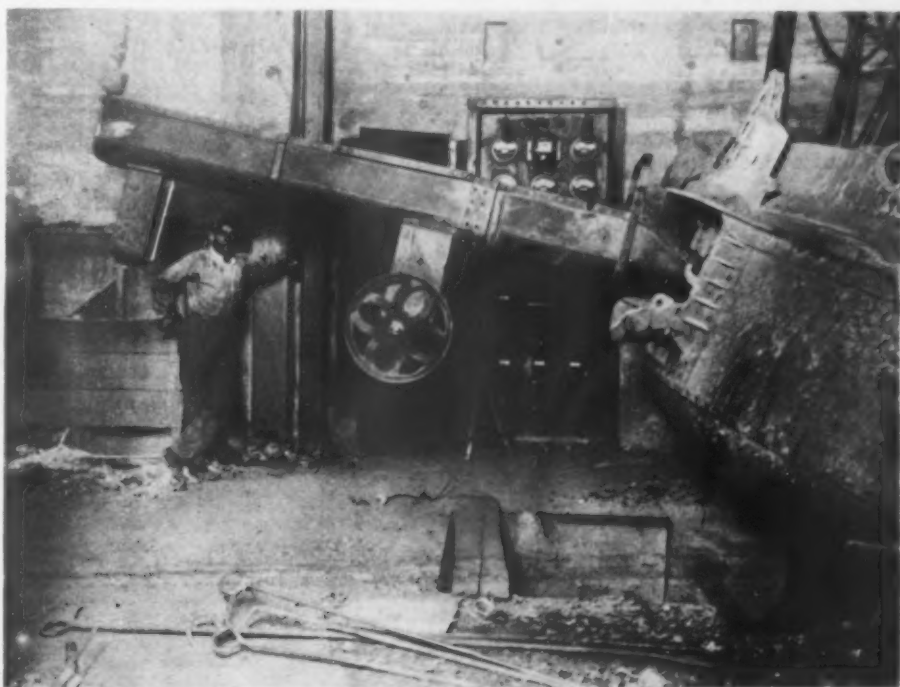
Cleveland Steel Tube Co. Organized

The Cleveland Steel Tube Co. has been organized with a capital stock of \$1,200,000 by former stockholders of the International Steel Tube Co. and has purchased the plant of that company, which had been in bankruptcy for some time, and which had never been placed in operation. The new company has also purchased 20 acres adjoining the site of the plant, on which the old company had an option. The value of this land is said to have materially increased since the option was taken. Members of the new organization state

that all the claims against the old company have been paid, including claims for plant equipment which had not been installed when the former company got in financial difficulties. The new company expects to issue bonds to the amount of \$400,000 to \$500,000 to provide working capital and hopes to be able to place the plant in operation within a few months. The officers of the Cleveland Steel Tube Co. are: Jacob Kahler, president; H. E. Smythe and J. E. Jontzen, vice-presidents; M. E. Cunningham, secretary, and H. D. Marble, treasurer. These officers, with F. E. Baker and Don F. Wood, constitute the board of directors.

The railroads on Sept. 15 had 10,792 locomotives in need of repair, or 16.8 per cent of the total number on line, according to reports filed Oct. 1 by the carriers with the Car Service Division of the American Railway Association. This was an increase of 275 over the number of such locomotives on Sept. 1, at which time there were 10,517, or 16.3 per cent.

The Electric Furnace Is Charged by a Sort of Mammoth Sugar Scoop. This scoop is loaded at the bin, then wheeled into position for charging. With the nose of the scoop inserted into the charging door of the furnace, the rear end is raised by a hoist and the material thus dumped into the furnace for melting



Iron and Steel Exports Fall Once More

August Imports Smallest of Year—Pig Iron Imports Lowest in Months—Machinery Exports Increasing, with Machine Tools Leading

WASHINGTON, Oct. 2.—Exports of iron and steel in August totaled 161,426 gross tons, valued at \$19,402,293, a slight decrease in volume from the exports of July, which amounted to 168,558 gross tons, valued at \$21,582,626. Imports of iron and steel in August aggre-

in August, 1922. Imports of machinery in August were valued at \$602,665, as against \$796,596 in July. Ma-

	August, 1922	August, 1923	Eight Months Ended August	
			1922	1923
Pig iron	1,791	3,117	17,564	20,928
Ferromanganese	76	.....	984	3,220
Ferrosilicon	28	84	277	657
Scrap	3,586	13,662	52,884	39,533
Ingot, blooms, billets, sheet bar, skelp.....	9,353	9,684	76,421	79,601
Iron bars .....	.....	765	.....	10,683
Steel bars	*13,488	12,625	*127,876	111,124
Alloy steel bars.....	246	117	3,027	1,666
Wire rods	979	1,548	35,115	19,675
Plates, iron and steel	6,231	8,586	71,687	83,852
Sheets, galvanized	9,690	6,942	83,002	83,891
Sheets, black steel.....	6,290	5,781	188,657	69,188
Sheets, black iron.....	1,026	1,341	8,589	10,217
Hoops, bands, strip steel	2,331	3,117	22,457	26,508
Tin plate, terne plate, etc.	4,092	5,995	53,545	71,330
Structural shapes, plain material	22,162	14,165	85,798	91,026
Structural material, fabricated	7,639	7,668	32,081	50,019
Steel rails	17,658	22,718	202,021	165,050
Rail fastenings, switches, frogs, etc.	2,266	3,067	24,260	26,053
Boiler tubes, welded pipe and fittings... ..	11,843	18,490	117,851	127,099
Cast iron pipe and fittings	2,095	2,486	17,270	17,897
Plain wire	8,452	4,690	86,745	62,206
Barbed wire and woven wire fencing	7,043	5,009	49,228	54,887
Wire cloth and screening	166	303	942	1,166
Wire rope	388	467	2,989	4,504
Wire nails	2,355	3,245	44,516	26,115
All other nails and tacks	563	760	5,983	6,114
Horseshoes	113	49	598	596
Bolts, nuts, rivets and washers, except track	1,429	1,614	11,866	12,667
Car wheels and axles	1,051	1,838	11,504	13,302
Iron castings	895	767	6,877	6,800
Steel castings	183	474	1,540	3,303
Forgings	135	252	1,635	2,118
Machine screws	37	.....	135	.....
Total	145,640	161,426	1,445,914	1,302,995

*Includes both iron and steel bars.

gated 45,439 tons, valued at \$2,475,512, as against 53,464 tons, valued at \$2,147,112, in July. Exports of machinery in August were valued at \$28,240,760, compared with \$26,469,980 in July, and with \$20,262,870

	August, 1923		July, 1923	
	Quantity	Value	Quantity	Value
Lathes	95	\$99,913	70	\$96,780
Boring and drilling machines	258	46,283	204	67,505
Planers, shapers and slotters	14	32,891	16	32,538
Bending and power presses	50	77,704	14	19,030
Gear cutters	59	22,131	7	20,371
Milling machines	28	48,481	13	17,913
Thread-cutting and screw machines	109	114,557	27	27,913
Punching and shearing machines	53	23,443	28	16,666
Power hammers	47	22,280	74	20,005
Rolling machines	1	1,100	13	6,010
Sharpening and grinding machines	852	93,670	1,452	87,102
Chucks, centering, lathe, drill and other metal-working tools	2,429	26,090	2,271	36,504
Pneumatic portable tools	15,027	410,070	987	54,946
Total	19,022	\$1,018,613	5,176	\$503,283

	August, 1923	Eight Months Ended August, 1923	August, 1923	Eight Months Ended August, 1923
Plates:			Galvanized Wire:	
Canada	7,155	71,563	Canada	993 10,292
Philippine Islands ..	382	549	Japan	741 14,208
Japan	156	612	Mexico	521 2,592
Cuba	120	740	Brazil	484 6,073
South America ..	84	899	Chile	370 3,894
Mexico	43	507	United Kingdom ..	267 1,544
Galvanized Sheets:			Cuba	253 1,862
Canada	1,878	25,616	Argentina ..	200 9,463
Cuba	1,069	9,530	Australia ..	181 4,663
Philippine Islands ..	588	4,834	Barbed Wire:	
Mexico	496	4,333	Cuba	863 7,344
Central America ..	399	2,700	Mexico	732 2,779
Chile	358	1,842	Brazil	722 7,025
Japan	249	2,870	British South Africa ..	511 4,541
Argentina ..	284	3,630	Australia ..	363 1,497
Colombia ..	9	3,561	Colombia ..	229 3,297
Black Steel Sheets:			Central America ..	235 2,407
Canada	3,026	38,998	Canada	105 4,521
Japan	1,080	19,907	West Indies ..	..... 6,153
Cuba	280	1,415	Argentina ..	..... 6,410
Argentina ..	51	1,690	Steel Rails:	
Philippine Islands ..	.....	160	Cuba	7,618 34,868
Tin Plate:			Japan	4,972 49,753
Canada	2,314	19,412	Canada	4,541 31,700
Japan	1,891	18,034	Brazil	1,929 2,733
Argentina ..	748	3,833	Philippine Islands ..	721 3,346
Uruguay ..	267	2,223	Colombia ..	27 2,136
China	36	5,833	Mexico	113 2,684
Cuba	91	3,288	Honduras ..	10 7,342
Hong Kong ..	78	2,022	Chosen	250 9,004
Mexico	153	1,413	Kwang Tung ..	..... 11,143
Chile	74	1,264	Argentina ..	..... 834
Italy .....	.....	2,266	Chile .....	..... 2,116
British India .....	.....	2,931	New Zealand ..	..... 400

chine tool exports in August totaled 19,022 in number, with a value of \$1,018,613, as against a total of 5176, with a value of \$503,283, in July.

	All Iron and Steel	Pig Iron	Semi-finished Material
*Average, 1912 to 1914...	2,406,218	221,582	145,720
*Average, 1915 to 1918...	5,295,333	438,462	1,468,026
Calendar year 1919.....	4,239,837	309,682	258,907
Fiscal year 1920.....	4,212,732	248,126	288,766
Calendar year 1920.....	4,961,851	217,958	216,873
Fiscal year 1921.....	4,168,619	129,541	82,549
Calendar year 1921.....	2,213,042	28,305	10,363
January, 1922	160,920	1,043	4,683
February	133,975	1,430	6,627
March	208,843	2,724	10,002
April	198,830	2,750	9,376
May	230,062	3,897	13,091
June	212,295	1,996	13,178
Fiscal year 1922.....	1,721,418	28,330	63,127
July	157,169	1,943	10,149
August	145,640	1,791	9,353
September	129,475	5,203	6,810
October	132,924	1,553	8,364
November	127,782	3,464	7,157
December	150,170	3,136	8,449
Calendar year 1922.....	1,986,297	30,922	107,201
January, 1923.....	123,190	2,482	10,563
February	133,902	2,786	7,733
March	163,920	2,881	11,416
April	177,471	1,844	11,247
May	203,389	1,848	12,824
June	171,183	2,960	9,652
Fiscal year 1923.....	1,816,329	31,891	113,377
July	168,558	2,966	6,480
August	161,426	3,117	9,684
Eight months	1,302,995	20,928	79,601

*Calendar years.

Imports of iron ore in August amounted to 267,677 tons, while imports of manganese ore were 23,026 tons. For the eight months ended with August imports of iron ore reached the substantial volume of 2,035,535 tons, while imports of manganese ore for this period

Imports of Iron and Steel into the United States (In Gross Tons)				
	August, 1922	August, 1923	Eight Months Ended August	
			1922	1923
Pig iron	17,105	14,564	62,332	328,464
Ferromanganese	15,959	6,845	69,093	64,894
Ferrosilicon	2,083	489	9,159	8,911
Scrap	9,085	9,900	48,045	140,762
Steel ingots, blooms, billets, slabs and steel bars	3,904	3,579	14,936	12,623
Rails and splice bars..	726	4,449	21,161	20,099
Structural shapes ...	355	1,389	1,598	7,463
Boiler and other plates*		828		1,312
Sheets and saw plates	54	740		1,672
Bar iron	619	1,208	3,909	6,271
Tubular products* ...		285		3,027
Castings and forgings*		232		2,028
Nails and screws*...		107		883
Tinplate	66	160	2,185	9,631
Bolts, nuts, rivets and washers*		22		150
Wire rods	94	60	1,067	2,195
Round iron and steel wire*		205		2,755
Flat wire and strip steel*		58		813
Wire rope and insu- lated wire, all kinds*		326		780
Total	50,050	45,439	233,868	614,726
Manganese ore	62,121	23,026	280,668	127,238
Iron ore	171,142	267,677	545,549	2,035,535
Magnesium	12,978	945	76,765	60,689

*Not reported separately previous to Sept. 22, 1922.

were 127,238 tons. Pig iron imports were 14,564 tons in August and 328,464 tons in the eight months.

Steel rails constituted the largest item of iron and steel exports in August. Of the foreign shipments in

Imports of Machinery (By Value)				
	August, 1922	August, 1923	Eight Months Ended August	
			1922	1923
Metal-working ma- chine tools and parts	\$18,926	\$14,486	\$146,515	\$265,069
Agricultural machin- ery and implements	54,967	84,486	424,515	660,045
Electrical machinery and apparatus* ..		12,587		363,748
Other power gener- ating machinery..		52,438		1,489,251
Other machinery ..	340,375	248,905	1,969,348	1,803,546
Vehicles, except agri- cultural	111,604	189,763	969,114	1,946,953
Total	\$525,872	\$602,665	\$3,509,492	\$6,528,612

*Not reported previous to Sept. 22, 1922.

this month, amounting to 22,718 tons, Cuba took the greatest tonnage, the quantity to that country amounting to 7618 tons, while Japan came second with 4972 tons and Canada third with 4541 tons. For the eight months Japan was the largest foreign buyer of American steel rails, taking 49,753 tons out of a total of 165,050 tons. Of the 5781 tons of black steel sheets exported in August, Canada took 3026 tons and Japan 1080 tons.

Imports of Iron and Steel in Gross Tons (Monthly Average)				
	Total Imports	Pig Iron	Ferro- alloys	Manganese Ore and Oxide*
1909 to 1913, incl....	26,505	14,132		
1914 to 1918, incl....	23,351	4,645	3,281	147,155
1919 to 1921, incl....	23,901	5,708	3,710	37,115
1922	59,545	31,954	9,117	31,204
January, 1923.....	120,078	83,935	5,120	829
February	67,704	35,793	9,234	4,636
March	106,197	72,344	9,030	12,799
April	77,903	36,371	7,221	14,071
May	75,885	39,764	10,482	12,734
June	68,019	30,033	12,794	36,138
Six months' average...	85,964	49,706	8,980	13,535
July	53,464	19,760	12,381	23,824
August	45,439	14,564	7,334	23,026

*Not included in "total imports."
†Includes ferroalloys.
‡Average for three years, 1916 to 1918 only.

Machinery Exports By Value				
	August, 1922	August, 1923	Eight Months Ended August, 1923	
Locomotives	\$1,528,478	\$289,725	\$7,000,192	\$2,982,943
Other Steam Engines	42,243	40,790	364,282	422,999
Boilers	118,084	38,053	678,785	737,986
Accessories and Parts	58,604	197,631	696,070	819,734
Automobile Engines	237,013	280,862	4,010,000	3,846,880
Other Internal Combustion Engines	682,921	528,536	4,205,513	4,679,451
Accessories and Parts for Electric Locomotives	222,701	300,546	1,750,707	2,329,765
Other Electric Machinery and Apparatus	10,462	321,057	186,821	2,666,287
Excavating Machinery	428,550	676,021	5,907,647	5,506,509
Concrete Mixers	75,896	65,650	926,186	993,994
Road Making Machinery	51,686	36,729	389,932	362,685
Elevator and Elevator Ma- chinery	28,236	101,846	217,750	632,763
Mining and Quarrying Ma- chinery	367,190	436,850	2,810,082	3,151,129
Oil Well Machinery	515,288	1,070,073	4,103,001	6,306,346
Pumps	160,280	808,054	2,979,286	4,390,852
Lathes	554,718	573,400	3,825,423	4,728,724
Boring and Drilling Machines, Planers, Shapers and Slotters ..	82,963	99,913	516,808	560,978
Bending and Power Presses ..	31,370	46,263	396,098	433,630
Gear Cutters	11,980	32,891	193,781	163,403
Milling Machines	16,061	77,704	262,702	193,377
Thread Cutting and Screw Machines	15,290	22,131	77,168	117,009
Punching and Shearing Ma- chines	27,631	48,481	213,873	289,061
Power Hammers	13,530	114,557	117,121	382,666
Rolling Machines	6,735	23,443	112,507	126,892
Sharpening and Grinding Ma- chines	10,534	22,280	75,213	105,001
Other Metal Working Ma- chinery and Parts of	734	1,100	165,119	18,849
Textile Machinery	79,356	93,670	519,335	656,519
Sewing Machines	527,438	481,850	3,680,856	3,126,092
Shoe Machinery	615,619	905,188	10,927,730	6,321,614
Flour-Mill and Gristmill Ma- chinery	614,495	961,916	4,063,045	5,752,283
Sugar-Mill Machinery	92,419	111,613	676,533	944,962
Paper and Pulp Mill Machinery	10,946	132,432	841,637	729,676
Sawmill Machinery	347,725	919,993	1,891,615	2,442,960
Other Woodworking Machinery	62,652	135,172	1,283,205	1,521,638
Refrigerating and Ice Making Machinery	30,816	165,249	372,568	478,142
Air Compressors	186,734	65,797	922,786	691,048
Typewriters	72,700	139,496	1,287,129	1,551,301
Power Laundry Machinery	286,000	260,956	1,466,899	1,672,845
Typesetting Machines	729,727	981,553	7,537,428	9,322,192
Printing Presses	80,577	105,887	435,005	682,231
Agricultural Machinery and Implements	253,882	387,709	2,503,704	2,361,949
All Other Machinery and Parts ..	200,735	476,196	2,454,375	2,931,460
Total	\$30,262,870	\$28,240,700	\$187,600,050	\$189,241,550

It is expected that as a result of the recent Japanese disaster considerable impetus will be given to American mills in the way of demand from Japan for black and galvanized sheets, pipe, wire nails and certain types of machinery. While it is doubted that this demand will be reflected in the September export movement, it is believed that it will be shown in foreign shipments of October.

Imports of August reveal a further decline in in-

Sources of American Imports of Pig Iron (In Gross Tons)				
	Eight Months Ended		Eight Months Ended	
	August, 1923	August, 1923	August, 1923	August, 1923
England	6,036	164,464		
British India	5,062	13,980		
Canada	2,375	40,858		
France	595	56,604		
China	275	1,225		
Sweden	120	705		
Scotland	100	16,771		
Mexico			1	1
Belgium				12,817
Germany				20,740
Austria				299
Total			14,564	328,464

coming shipments of pig iron. The movement of this blast furnace product to the United States gradually has been tapering off since domestic furnaces have been meeting demands. Of the imports of pig iron in August, amounting to 14,564 tons, 6036 tons came from England and 5062 tons from Canada.

Sources of American Imports of Iron Ore (In Gross Tons)				
	Eight Months Ended August		Eight Months Ended August	
	August, 1922	August, 1923	1922	1923
Spain	7,328		28,197	184,000
Sweden	61,304	52,523	185,952	599,082
Canada	87	369	1,408	23,379
Cuba	65,917	96,650	199,489	527,001
Other countries	36,506	118,135	130,503	702,073
Total	171,142	267,677	545,549	2,035,535

New Experiments with Repeated Shocks *

Influence of Cold Drawing Considerable, Especially on Ductility—Ultimate Strength and Elastic Limit Raised; Compression and Elongation Lowered

BY LEON GUILLET

IN a preceding article†, we drew attention to the importance which is attributed to resiliency, while not enough stress is laid upon the elastic limit. We have seen pieces of extra soft steel with 2 per cent nickel, which frequently broke, giving 30 to 35 kilogrammeters (217 to 253 foot-pounds) in the shock test on Mesnager bars. To avoid all variation in breakage, it was found necessary to temper them and thus make them exceed the elastic limit of 30 to 40, while the resiliency came down to 13 kilogrammeters (94 ft.-lb.).

Moreover, we clearly pointed out that this point of view was not new; that especially the experiments of Mr. Nussbaumer‡ had demonstrated it quite clearly. He added, however, that at all events it was necessary to insist on the steel makers and metallurgists realizing clearly these little known facts; moreover, to insist on the tests being made a good deal more popular, by continued efforts along these lines.

To put the matter still more tersely, we have made a series of tests that have seemed suggestive, notwithstanding the criticisms which might be made against them. In these tests, we took a bar of ordinary soft steel, of good quality, which was tempered at 850 deg. C. (1562 deg. Fahr.); the bar was of round section, with a diameter of 18 mm. (0.71 m.). We cut it into five equal parts and, while one of these parts was left at its original diameter, the others were turned to 17, 16, 15.5 and 15 mm. (0.67, 0.63, 0.61 and 0.59 in.).

Then the first three were drawn out so as to reduce all three, as well as the piece of 18 mm. diameter, to 15 mm. Under these conditions we had five bars, all of 15 mm. diameter, which had undergone the following treatments:

1. A tempered bar.
2. A thin drawn bar, tapered 0.5 mm. on the diameter.
3. A thin drawn bar, tapered 1 mm. on the diameter.
4. A thin drawn bar, tapered 2 mm. on the diameter.
5. A thin drawn bar, tapered 3 mm. on the diameter.

These bars were given the following four tests, which were twice repeated:

Tension Test

This was performed on a test bar of 100 mm. (3.937

*Paper presented before the Franco-Belgian Association of Testing Methods. Translated by E. J. Lowry, Hickman, Williams & Co., Pittsburgh.

†See *Metallurgical Review of French Papers*, February, 1921, page 96, and verbatim report of the meeting of Nov. 20, 1920, of the Franco-Belgian Association of Testing Methods.

‡*Metallurgical Review*, 1914, page 1133.

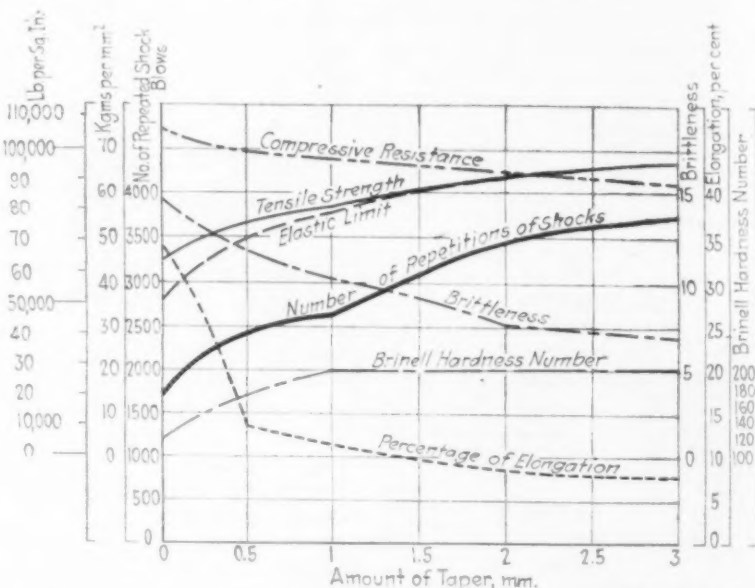
Degree of cold hammering defined by taper of drawing	Tension Test				Brittleness Test		Hardness Δ	No. of shocks applied
	Rupture*	Elastic Limit*	Elongation, Per Cent	Compression*	ρ	Angle		
0	44.4	35.1	34.5	73.9	14.7	Bent double	121	1,855
—	44.7	35.7	33.8	74.9	14.7	Bent double	—	1,519
0.5	52.4	49.0	13.9	68.0	11.6	Bent double	171	2,519
—	53.3	50.1	13.2	70.5	11.8	Bent double	—	2,330
1.0	56.8	55.7	11.0	68.0	9.6	Bent double	197	2,591
—	56.5	55.3	11.7	68.0	10.7	Bent double	—	2,675
2.0	63.4	63.4	8.0	64.1	7.5	Bent double	200	3,203
—	63.7	63.7	8.8	65.5	7.7	157 deg.	—	3,678
3.0	66.8	66.8	7.3	61.7	6.9	159 deg.	200	3,745
—	67.1	67.1	8.0	61.7	6.7	160 deg.	—	3,703

*In kg. per sq. mm. (Multiply by 1422 to obtain lb. per sq. in.)

in.) length and 13.8 mm. (0.543 in.) diameter, the metal being, as should be carefully noted, in its cold hammered or tempered condition.

Breaking Test

This was performed on Mesnager test bars of 10 x 10 x 55 mm. (0.39 x 0.39 x 2.16 in.), with groove of 2 x 2 mm. (0.08 x 0.08 in.) round bottom, which were broken with Charpy hanging drop hammer.



General Comparison of Compressive Resistance with Tensile Strength and Elastic Limit, Ductility and Brittleness, Resistance to Shock and Brinell Hardness Number

Hardness Tests

These were made under a pressure of 1000 kg. (2205 lb.), with 10 mm. (0.39 in. diameter) ball, the test being made on a shock test bar, with the direction of application perpendicular to the direction of drawing.

Repeated Shock Tests

These were taken with the Cambridge apparatus, the hammer weighing 2385 grams (5¼ lb.) the speed being 60 strokes a minute and the height of drop 33 mm. (1.3 in.).

It should be well noted that, as the test bars of the different determinations did not have the same dimensions, the results could not be obtained exactly on the same metal, owing to the possibility of heterogeneity in cold hammering. However, it was impossible to perform the tests in any other way. If it had been possible to draw the bars to the exact dimensions desired by the shock test, the cold hammering would not have

been the same, if the drawing taper was constant on a bar of 10 x 10 mm. (0.39 x 0.39 in.) and on a round bar of 15 mm. (0.59 in.) diameter. Moreover, the groove itself would always have taken away the skin of the metal at the most vital point.

The table sums up the results obtained. These results call forth numerous and important remarks. The quality of the metal used is truly exceptional, being an open-hearth steel with the following analysis:

C	= 0.12 to 0.13
Mn	= 0.61
Si	= 0.13 to 0.14
S	= 0.021 to 0.023
P	= 0.041

The tension test is influenced considerably by the taper of drawing, even though extremely small (0.5 mm. or 0.02 in. on the diameter). It is therefore an error to believe, as the drawers do, that it is possible to draw a steel, roughly temper it, give it a small taper and obtain a steel possessing sensibly the qualities of well worked metal. It is noted that the elongations especially drop very quickly.

Cold hammering has a more pronounced influence on the elongations and elastic limit (which soon becomes confounded with the breaking load), than on the rupturing load, and especially on the compression, which here keeps very high values.

Hardness and strength have no constant relation to each other. This point was already treated in an essay by Mr. Portevin and ourselves. Below are given the coefficients ascertained:

Hardness No.	Rupture kg. per sq. mm.	Coefficient
Δ		
121.....	44.4	0.367
171.....	52.4	0.306
197.....	56.8	0.288
200.....	63.4	0.317
200.....	66.8	0.334

Little resiliency is obtained. The test bars will take a taper of 1 mm., which makes the elongation fall to 11 per cent. Breakage takes place only for products whose cold hammering is such that the elastic limit is sensibly equal to the breaking load applied.

Finally, the results given by repeated shocks show that the number of strokes necessary to cause breakage will quickly grow with cold hammering, at least under the conditions of our tests. Hence, if the results obtained on tempered metal and on the cold-hammered metal (taper 2.5 mm. or 0.1 in.) are considered, it is seen that:

- The breaking strain increases 50 per cent.
- The elastic limit increases 90 per cent.
- The elongations decrease 76 per cent.
- The compression decreases 16 per cent.
- The resistance to repeated shocks increases 110 per cent.

Chevrolet Company Orders Ovens for Copenhagen Plant

The Chevrolet Motor Co. has recently placed its order, through the General Motors Export Corporation, for complete japanning equipment for the Chevrolet plant in Copenhagen, Denmark. Designed and built by Young Brothers in Detroit in cooperation with the Chevrolet engineering staff, the equipment will consist of two truck type compartment body ovens and two fender ovens which will also be used for the japanning of miscellaneous small parts. All of these ovens are to be furnished with indirect gas heaters. The equipment, which consists of three carloads, is now being shipped, and will soon be installed in Copenhagen.

W. W. Lewis and P. H. Schaff have been elected directors of the Falcon Steel Co., Niles, Ohio, due to enlargement of the board from five to seven members. Mr. Lewis, who has been general superintendent, was also named general manager. Directors have authorized the regular quarterly preferred dividend of 1% per cent, the regular common payment of 1 per cent, and an extra dividend of 1/2 of 1 per cent.

Inventor of Sykes Gear Generator to Come to America

W. E. Sykes of the Power Plant Co., Ltd., West Drayton, England, has severed his connections in the British Isles and will arrive in this country to join the staff of the Farrel Foundry & Machine Co., Inc., Buffalo, N. Y., as consulting engineer. He is recognized as one of the foremost authorities in Europe on the subject of gearing. He has designed installations for all types of duty and has made a specialty of heavy rolling mill work and stationary and marine turbine drives. He is the inventor and designer of the Sykes gear generator, which generates double helical gears with continuous teeth and sharp apices so that full bearing is secured across the entire face width. These machines were brought to this country about a year ago by the Farrel company and installed in the plant at Buffalo, N. Y. Since that time, the Farrel plant has made these gears for general industrial uses.

Mr. Sykes spent seven months last winter in this country, so he is, of course, well acquainted with American practice in engineering and business.

New England Iron and Hardware Outing

The annual fall outing of the New England Iron and Hardware Association was held at the Tedesco Country Club, Swampscott, Mass., Tuesday, Sept. 25, and sustained the reputation of its predecessors in being a thoroughly delightful event. Myron B. Damon, president, presided at a brief business session, at which appropriate resolutions on the death of the late Frederick H. Butts, presented by E. P. Sanderson, president E. P. Sanderson Co., were adopted.

The golf tournament was the event of the day. Prizes were donated by the Trumbull Steel Co., Standard Horse Shoe Co., Youngstown Sheet & Tube Co., Bethlehem Steel Co. and President Damon. The winners were: First net, the Loomis cup and a steamer rug, F. M. Butts, Butts & Ordway Co.; best gross, Damon cup and a pipe, A. P. Chase, Chase, Parker Co.; second net, a set of golf balls, C. C. Butts, Butts & Ordway Co.; third net, Bethlehem Steel Co. cup, J. E. Kelley, Simonds Saw & Steel Co.; largest score, Damon prize, E. P. Williams, Corbin Screw Co.

Arrangements were in charge of George J. Mulhall, manager of the New England Iron and Hardware Association, and F. W. Brigham, Bethlehem Steel Co.

Simplification in Prepared Roofings

WASHINGTON, Oct. 2.—Simplification of prepared roofing was decided upon at a meeting here last Thursday held between representatives of the Division of Simplified Practice, Department of Commerce, the Chamber of Commerce of the United States, manufacturers, distributors and consumers. It was voted to eliminate all grades or kinds of slate-surfaced and also stone-surfaced prepared roofing that do not measure up to requirements of the "Class C" label of the Underwriters Laboratories and to reduce the varieties of smooth surface roofing to seven lines or grades, weights and qualities being considered. The recommendation is to become effective Jan. 1, 1924. According to William A. Durgin, chief of the division, the proposed eliminations were supported by the American Institute of Architects, the National Retail Hardware Association, the National Retail Lumber Dealers' Association, the Southeastern Builders' Supply Association and the Prepared Roofing Association.

The Warren Steel Castings Co., St. Louis, which been in the hands of receivers for several years, has been reorganized. New officers include Julius Seidel, president Julius Seidel Lumber Co., president, and Harry Benjamin, president Harry Benjamin Equipment Co., treasurer. The plant was destroyed by fire about six months ago. A settlement has been made with the insurance company, and a new plant will be erected. The company's capital stock is \$150,000.

Careful Selection of Negroes Urged

Leader of Colored Men Gives His Views on Problems
Resulting from Investigations from the South
—Worth Not Yet Established

BY L. W. MOFFETT

WASHINGTON, Sept. 25.—The negro migrant industrial laborer in the North still must prove his worth. Not as yet has he passed beyond the classification of the emergency laborer. While he now has his day in court, the actual relative evaluation of the Southern negro in the iron and steel plants, foundries, machine shops, and other industries, will face the acid test whenever there is a slackening in operations and consequently dismissal of the more unfit employees. It will be then that the negro from the South, who is experiencing the profound change from a section largely agricultural to another that is predominantly industrial, meeting new conditions, different employers and new jobs, will come to grips in the competitive field of labor.

Students of sociology and industrial economics, as well as those who are directly interested in the movement, are watching with the deepest interest the performance of the Southern negro as an industrial producer, but, awaiting the passing of time and giving them a chance to gather more experience, are holding judgment in abeyance. There are those who believe that the negro is entering upon his second emancipation and is but slightly removed from the same environs that obtained when Lincoln proclaimed him free. Included among those sharing this view is Phil H. Brown, himself a colored man, who is a Commissioner of Conciliation of the United States Department of Labor.

Drafted in Industrial Crisis

"The negro migrant has embarked upon a pilgrimage to the goal of enlarged opportunity shadowed by the doubts of his friends and the venality of his foes," said Mr. Brown. "He is drafted in the great industrial crisis as he was drafted in the war. He is sought to fill the unskilled functions of alien labor. At best, and without thorough thought, he is classified as emergency labor, rather than preferred. To the industries the inclusion of his labor is an experiment; to him it is the realization of a century of dreams. The tolerance of one combined with the awakening of the other should render this labor permanent in the scheme of industry, but the failure of either to contribute its full share in essential cooperation will cause the great plan of absorbing one-tenth of the nation's population into its industrial life either to fail or be hopelessly deferred."

Mr. Brown is firmly convinced that negro labor has an opportunity to prove its industrial value to the country. He speaks of the situation as a crisis that is double-edged because in the same degree that it benefits those that migrate, it will help those who have remained at home. He has warned that this labor must never lose sight of the fact that it is on trial and its defense and liberty are left in its own hands. Naturally, a keen student of the subject, Mr. Brown is thoroughly aware of many differences between white and colored labor. One point he has brought out sharply is that white labor moves collectively and effectually, while negro labor works individually and by necessity. For this reason, he said, some opposition will logically accrue from organized labor, but this opposition in his opinion is not as persistent nor of the character that is generally believed. He called attention to the fact that there are 488 locals of colored workers in various industries affiliated with the American Federation of Labor, and that the United Mine Workers of America have thousands of colored members and officials.

It would be wrong to say that employers in the iron and steel and other industries have acclaimed the Southern negro as being an entirely proficient and sat-

isfactory worker. In instances he has proved as much. Many employers not altogether satisfied with the Southern negro worker, have expressed confidence, that if properly selected, he has all of the potential requirements and only needs experience and training to develop into a competent employee, whether skilled or unskilled. Mr. Brown is thoroughly aware of this view, and referred to the many letters that he has received from employers in the North showing an enormous turnover in negro labor. It is the view of Mr. Brown that the iron and steel and other large employing interests should adopt a method of careful selection of negro laborers from the South. The plan he has in mind is that these large employers of labor establish their own employment stations at so-called "border" towns which constitute gateways to the North.

Propaganda of Employing Agents

Through this method it is confidently believed that the turnover would be greatly diminished and that it would also have the advantage of wiping out a lot of loose propaganda of professional employing agents, who hold up the North as the promised land and accept Southern negro workers for employment regardless of their qualifications. It also has been pointed out that in the absence of a process of selection many of the less desirable negroes purposely have been pushed through these gateways to the North. It has been estimated that not more than 20 per cent of the many negroes from the South have been selected for employment in industries of the North. In other words, they were accepted in masses upon the high wave of labor demand and in the face of restricted immigration. In general, no preparations for housing the negro migrants was made, although there are noticeable exceptions. If this new class of labor in industries of the North is to be kept permanently, it is held that the first fundamental duty of the employer is to see that the negroes are provided proper housing and thus given the outstanding inducement to remain steadily at work at a given point, instead of "rambling" as the roving habit of the Southern negro is colloquially expressed. The necessity of the Northern employer understanding the negro from the South, and vice versa, manifestly is obvious and it is felt that the Northern employer could take his greatest step forward in this direction by giving attention to the social welfare of his new class of workers. There will be many other characteristics of the negro that the Northern employer will have to become acquainted with. Mr. Brown has pointed out that the negro has always been and probably always will be a problem to civilization.

Change in Immigration Laws

The great industrial revival set in simultaneously with a sweeping change of the immigration laws. The need of labor became insistent, and industry turned to the massive multi-colored labor reserve, as it is characterized by Mr. Brown, and it was called out in the emergency. Immediately an upheaval of labor conditions ensued. Negro men and women in the number of 358,856 according to surveys of the Department of Labor, deserted the Southern industrial centers since Dec. 1, 1922. These supplementing 250,000 of the same class of workers, who were left in the North during the wartime migration from 1917 to 1919, making a conservative total of 608,856 negro units, added to industrial labor in the North within five years. When this large movement is considered, it will be readily recognized that Northern industries in taking this new class

of labor have created a social problem and it may be said to the credit of more intelligent negroes that they are thoroughly aware of this fact and are aiding in trying to evolve a solution. The present-day results from the study of placement of negro labor passing from the South to industries in the North, are mixed and interesting. Some of them are anything but gratifying. On the other hand, others are pleasing. In connection with the latter, Mr. Brown pointed out that an unexpected phase is the inclusion of skilled workers migrating to the North. Returns from an analysis of payroll statistics of 273 employers of negro labor in California, Kentucky, Delaware, Illinois, Indiana, Kansas, Kentucky, Maryland, Massachusetts, Michigan, Missouri, New Jersey, New York, Ohio, Oklahoma, and Wisconsin, showed a heavy intake of negro labor. Diffi-

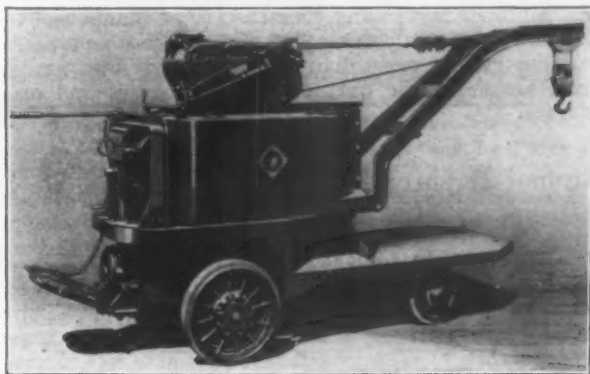
culties were encountered in discriminating as to whether those employed were recent migrants or were from the class that were already located in the North. However, sufficient specific classification was given, Mr. Brown said, to suggest that the South is not only yielding up a great mass of unskilled workers, but a remarkable number of skilled hands are finding employment.

Mr. Brown said that he refused to confess that negro labor is inferior. He declared that it is striving to catch up with acknowledged standards and that when it does catch up, it will keep up. As a sound commercial proposition, he maintained, the industry should foster the improvement of the quality of this labor, not only for emergencies, but because one-tenth of our population must not trail behind the nine-tenths, nor tarry along the fringe of our industrial progress.

Electric Portable Crane for Industrial Service

The Elwell-Parker Electric Co., Cleveland, has brought out a new type of electrically operated portable crane for industrial handling. This has been designed especially for the general storekeeper of a railroad. It may be driven directly into a box car, down a store house aisle or out into the yard or shop where its runway may not be very smooth.

The lifting unit, power plant and battery counter-balance the boom. This is supported on a strong steel column set into a heavy base anchored to an all-steel frame fitted with wide axles. The hoisting mechanism consists of a single motor driving two separate drums



Portable Crane for Use by General Storekeeper of a Railroad. It may be driven directly into a box car

through worm gearing running in oil. Each drum is fitted with a $\frac{3}{8}$ -in. plow steel cable, one to raise and lower the boom and the other to handle the hook. Each is operated independently so that the load may be picked up at any point over the end or side of the crane, the boom swinging from left to right. For stacking stores the crane is provided with a boom of suitable length, although somewhat shorter than that furnished for use in the locomotive shop where it is necessary to reach up over the boiler.

The crane is propelled by an electric motor direct connected through worm gearing on the axle beneath the battery and back of the crane column. This motor as well as the hoist motor receives power from the same battery. The leads from this battery, which swings with the boom, pass down through the hollow crane column. A separate controller operates each motor. When the service demands, a motor to revolve or slew the crane is provided and this also receives power from the same battery. The forward axle or that nearest the hook is quite heavy and serves as a rolling outrigger. Its wheels are equipped with 15 x 3½-in. solid rubber tires. The drive wheels are provided with 22 x 4½-in. tires. All four wheels are used for steering.

This truck crane was exhibited last week at the Broadway Auditorium, Buffalo, in connection with the convention of the Association of Iron and Steel Electrical Engineers.

Shop Practice Division of Mechanical Engineers Adopts Wide Program

Reorganization of the machine shop practice division of the American Society of Mechanical Engineers is planned. Definite aims are the encouragement of original research in the machine shop field and of education in machine shop practice, and the advancement of standards of practice as well as its exact knowledge. Educational institutions will be asked to adopt wider programs of instruction in this sphere.

Ten years of organized effort have been mapped out. Cooperation is contemplated between the division and local sections of the society and branches in 62 industrial centers, thus enlisting the active support of the society's entire range of membership. In each of these centers the division will name one or more representatives who will act as liaison officers.

Research and standardization are among the problems to be dealt with, the preparation of papers for the annual and spring meetings of the society also being an important task. "These papers," says the report of the special committee on plan and scope, "should be of a fundamental or research nature. In general, they will concern machine shop processes applicable to machine shops everywhere rather than to those in a particular industry. By laying down plans under a 10-yr. schedule, it will be possible for a sub-committee on planning to keep in touch with research and experimental work of various kinds and arrange to have it presented before a meeting of the society when its development is sufficiently advanced."

Enlargement of the literature of machine shop practice and a wider common knowledge of its developing principles will be accomplished, it is expected, not only through discussions at the national meetings but also through the regional and local section meetings, where, it is felt, the machine shop practice papers should relate to the problems of specific industries of the several sections. It has been suggested that in localities where several plants produce similar products, and thus have similar production problems, groups be organized to work up and to present discussions bearing on their common activities.

Joint sessions with other professional divisions of the society are a part of the plan, and it is proposed also to establish contact with other professional societies, trade organizations, and other bodies.

The new organization of the division comprehends an executive committee, and sub-committees on meetings and papers, publicity, membership, and planning. The planning sub-committee will seek research problems of interest to the division, call them to the attention of the research committee of the society's council, and assist in furthering their progress. It will also call to the attention of the standardization committee of the council desirable standardization subjects. To assist the executive committee in organizing representative committees of the local sections, a group headed by K. H. Condit, New York, has been selected. Associated with Mr. Condit are: A. L. DeLeeuw, Erik Oberg and Frederick Franz, New York; J. J. Reynolds, Easton, Pa.; Earle Buckingham, Hartford, and Wilbur J. Peets, Elizabethport, N. J.

SAFETY CONGRESS MEETS

Dr. Royal B. Meeker Describes America as the Most Careless Nation in the World

BUFFALO, Oct. 1.—The twelfth annual Safety Congress opened here today with a registration of 3000 delegates. The congress includes meetings of the American Association of Industrial Physicians and Surgeons, and the annual safety conference of the New York State Department of Labor.

One of the first acts of the meeting was the acceptance of an invitation from the League of Nations to send a delegate to the meeting of the 55 nations at Geneva, Switzerland, Oct. 22, to tell what is being done in America in the interest of safety.

While the principal session was in progress at the Hotel Statler safety talks under the supervision of various groups were given in stores and shops.

In his opening address, President Dow gave a summary of the toll taken by carelessness in the United States. Accidents in the year 1922 cost 75,000 lives, he said.

"Every city contributes its quota of victims to the tragic and unnecessary evil that goes on day after day, week after week and that is increasing year after year in continental America largely through individual carelessness and lack of organized effort to eliminate accidents. It is bad enough that 75,000 persons of any age or station in life should be sacrificed on the altar of carelessness in a single year, but when we stop to consider that out of that number 20,000 were children under fifteen years of age and of that number 10,000

were babies under five years, it is time to rise up and say 'this cannot go on. Let us get together and put a stop to it and wipe out this blot on the nation.'

"The consummation of 11 years of effort to develop safety measures has been the realization that each individual can save others from premature death and can prevent personal injury if he will conscientiously do the things we have together learned will bring about the maximum safety."

Bernard L. Shientag, Industrial Commissioner of New York, welcomed the delegates in behalf of the workers of New York State. In his address Mr. Shientag stated that the elimination of the 12-hour day in the steel industry would bring about a gradual decrease in the number of accidents as well as in the severity of these mishaps. There will be less lost time by employees and increased efficiency and production throughout the industry, he declared.

Dr. Royal B. Meeker, Commissioner of Labor and Industry of the State of Pennsylvania, delivered an address at the afternoon session Monday. Dr. Meeker spoke on "International Aspects of the Safety Problem."

Dr. Meeker declared that America today is the most careless nation in the world.

"We lead the world in accident prevention, but we also lead by leagues in accident occurrence and in the economic losses due to accidents," he said. "In no line do we outdistance Europe more emphatically than in the killing and maiming of men in industry and on the public streets. We kill and maim more men per thousand and destroy more per thousand tons of product than any other country."

Dr. Meeker attributed the appalling loss of life and injuries to workers to high speed production and the improper layout and construction of plants and to the heterogeneous mixture of nationalities and races in industry, but more than all these to our own native recklessness on the part of both employers and employees.

COMING MEETINGS

October

National Safety Council. Oct. 1 to 5. Twelfth annual meeting, New Statler Hotel, Buffalo. W. H. Cameron, 168 North Michigan Avenue, secretary.

American Society for Steel Treating. Oct. 8 to 12. Annual convention, Motor Square Garden, Pittsburgh. W. H. Eisenman, 4600 Prospect Avenue, Cleveland, secretary.

American Engineering Council of the Federated American Engineering Societies. Oct. 12 and 13. Meeting at Rochester, N. Y. L. W. Wallace, 26 Jackson Place, Washington, secretary.

West Virginia and Kentucky Association of Mining, Mechanical and Electrical Engineers. Oct. 19 and 20. Third annual convention, Hotel Frederick, Huntington, W. Va.

American Society of Mechanical Engineers. Oct. 23 and 24. Regional meeting, Chattanooga, Tenn. E. C. Patterson, general manager Chattanooga Boiler & Tank Co., Chattanooga, in charge of details.

National Association of Farm Equipment Manufacturers. Oct. 24, 25 and 26. Thirteenth annual convention, Statler Hotel, Cleveland. J. B. Bartholomew, Peoria, Ill., president.

American Welding Society. Oct. 24, 25 and 26. Fall meeting, Pittsburgh. M. M. Kelly, 33 West Thirty-ninth Street, New York, secretary.

American Iron and Steel Institute. Oct. 25, fall meeting in New York; Oct. 26, visit to Aberdeen Proving Ground, Md. E. A. S. Clarke, 40 Rector Street, New York, secretary.

Society of Automotive Engineers. Oct. 25 and 26. Production meeting at Cleveland. Coker F. Clarkson, 29 West Thirty-ninth Street, New York, general manager.

American Gear Manufacturers' Association. Oct. 25, 26 and 27. Fall meeting, Mountain House, Lake Mohonk, N. Y. T. W. Owen, 2443 Prospect Avenue, Cleveland, secretary.

American Management Association. Oct. 29 to Nov. 1. Annual convention, Hotel Astor, New York. W. J. Donald, 20 Vesey Street, managing director.

Annual Report of American Iron and Steel Institute

The Annual Statistical Report of the American Iron and Steel Institute for 1922, the compilation of which has been in charge of William G. Gray, has been published. The statistics contained in this volume have been for the most part published in association bulletins and in THE IRON AGE. The table showing comparative production by the United States Steel Corporation and of all other companies indicates that in 1922 the Steel Corporation produced 44.2 per cent of the pig iron compared with 52 per cent in 1921 and 39.4 per cent in 1920; it produced 45.2 per cent of the steel ingots and castings as compared with 55.4 per cent in 1921 and 45.8 per cent in 1920, and it produced of all kinds of finished roll products 42.9 per cent in 1922 as compared with 50.5 per cent in 1921 and 41.6 per cent in 1920. The percentage of the United States Steel Corporation was largest in the production of spiegeleisen and ferromanganese, 63.51 per cent in 1922, and smallest in the case of coke, 35.66 per cent.

Curtailing Production of Ford Parts

The Ford Motor Co. has notified foundries throughout the country to curtail production of Ford parts beginning immediately. The order was issued, it is reported, as the first move in the company's plan to reduce its inventory. The stock of parts in the company's plants and in the warehouses of its dealers is said to be sufficient to take care of expected requirements for the remainder of the year. It is not the intention of the company at this time to reduce its production of passenger cars and trucks, and schedules for October call for a slight increase in the output over September. Some foundries in Ohio and Indiana which had been employed on Ford work have already reduced their operations, a number of men being laid off from each shop.



SIR ARTHUR BALFOUR

Hopeful for Britain's Industrial Future

Sheffield Steel Maker, Head of British Chambers of Commerce, Believes Financial Policy Will Bring Ultimate Advantage

BY DR. RICHARD MOLDENKE

LONDON, ENGLAND, Sept. 5.—The wonderful courtesy shown the party of American foundrymen visiting in England has afforded an excellent opportunity to obtain first-hand information on the present status of the British iron and steel industry from its leaders. To give special enlightenment to the readers of *THE IRON AGE*, the writer has extended this inquiry further by interviewing one of the foremost men of affairs in Great Britain, who is now president of the Association of British Chambers of Commerce—Sir Arthur Balfour—and by giving his thoughts on how the world's current events are affecting the present and are likely to affect the future development of Britain's iron industry.

Serious Unemployment

The first thing noted by a foreign visitor to England's foundries and steel mills is the extreme gravity of the unemployment problem, the situation being the reverse of that which for most of this year has prevailed in the United States. There are, for example, 50,000 idle men in Birmingham and 35,000 idle in Sheffield, out of populations of 900,000 and 800,000 respectively. With enormous tax rates, part of which go for "doles" to idle people; with acute crises existing on the Continent and the new disruption of business with Japan, it does indeed take a man of clear vision to look into the future without being unduly influenced by the black outlook of the present. That the majority of Englishmen are extremely pessimistic at the moment is amply borne out by the press and in conversations with leading industrial men, as well as members of Parliament.

The cause does not lie altogether in the terrific slump of business, but in the moral bankruptcy of a great part of the working classes—any number of former good workers preferring a life of idleness with municipal charity, to getting busy and earning their living in the old accustomed manner.

Sir Arthur Balfour, head of Arthur Balfour & Co. of Sheffield, is well known in the United States, and has but recently returned from studying industrial conditions there. He is the author of an important report on reparations, which has served as the basis of the policy of the present British Cabinet in dealing with this complicated question.

Sir Arthur has visited America frequently, and recalled meeting the writer in Pittsburgh in the early days of his activity. Now in the prime of his life, and president of the most important commercial body of his country, his views on how Britain is affected by present world currents and how her basic position will serve her interests in the developments to come are the result of wide observation and clear thinking. Without quoting him directly I am giving the purport of Sir Arthur's comments.

Forces of Destruction

The world of today is facing the result of two great lines of destruction. There is first the vast destruction of material wealth by the war, the waste and inefficiency, in providing the means to conduct this war, and the incident industrial over-building that was and was not necessary in connection with so great an up-

SIR ARTHUR BALFOUR is head of the firm of Arthur Balfour & Co., steel manufacturers, Sheffield. He commenced his association with these works when he was 14 years of age, and within a quarter of a century they came entirely under his control. He has been master cutler of Sheffield, an honor which the city confers on those of its citizens connected with the steel trade who have rendered outstanding service.

Sir Arthur was born in London in 1873, and received his early education in London and Harrogate. Left an orphan, he was brought up by his godmother, who afterward married the then managing director, Robert Schott, of the Dannemora Steel Works, Sheffield. The firm, then known as Seebohm & Dieckstahl, had been founded in 1865 by Henry Seebohm, a native of Bradford. From small beginnings in Leadmill Street, Sheffield, it soon removed to Willey Street, Wicker, where it now stands with numerous extensions to its credit. A branch steel works was established in another part of the city in 1899, and a subsidiary company, the Eagle & Globe Steel Co., Ltd., was formed in 1902 to deal with the export business.

The firm's jubilee in 1915 was signaled by

the change in its name to that of Arthur Balfour & Co., Ltd. By that time Mr. Balfour had been connected with the firm for 28 years. At the age of 19 he was sent to America to gain practical experience in engineering methods there at the works of the New York Car Wheel Co. of Buffalo. At 21 he became works manager, having the control of 200 workmen, most of them Poles. A year later he was promoted to the position of general manager. Soon, however, he left that position and returned to the Dannemora works.

During the war he organized Sheffield's hospitality to the Belgian refugees, being Belgian consul in Sheffield; filled the position of one of the industrial advisers to the Treasury; was a member of the royal commission on railroads; was on Mr. Lloyd George's advisory committee in regard to munitions, and also a member of the Sheffield munitions committee; a member of the Board of Trade departmental committee on engineering trades; president of the Sheffield Society of Engineers and Metallurgists. He is a magistrate for the city of Sheffield. This year he was elected president of the Associated Chambers of Commerce of Great Britain and was knighted by the King.

heaval involving terrific inflation. Then there is—and just as deplorable—a great wave of moral destruction reaching into every activity and thought of mankind the world over. The fiber of humanity has been seriously weakened, and selfish interests have come to dominate ruthlessly individual and national activities. The determination to obtain wealth and advantage of position without giving an equivalent in return is seen everywhere. Material wealth can be replaced in time, but the recovery of moral stamina is a longer and more serious problem for nations to face. England shows much of this in her idle workingmen. While every effort is being made to give employment to those who really want to work and thus bring costs to a better competitive basis in the production of manufactured product, the desired object is yet far from consummation. Meanwhile politicians and press are exploiting the situation from the individual viewpoint.

Factors in Britain's Strength

Sir Arthur looks beyond the immediate situation. He holds that not even excepting the United States, Great Britain of all countries has proceeded more completely along the lines of national deflation, and stands in the soundest financial position of any European nation today. By disregarding the phantom reparations return in her budget, taxing directly to the limit of the country's capacity, adjusting the American debt squarely, and properly caring for her home interests, Great Britain has a credit today that is solid and unassailable. Hence, when Germany, France and Belgium come to the final point of forcible deflation by the trend of events, with the financial agony this brings with it, the present period of serious depression in Great Britain will give way to one of unexampled prosperity, with full production from her industrial establishments to supply the world's needs.

Belgium's Competition

Again, Britain has always felt the competition of other countries and adjusted herself to it. It is always thought that Germany was the keenest commercial rival, and yet Belgium is really more so with its poor home markets and low production costs. Britain, therefore, sees little of new commercial terrors to be faced once the inevitable summary deflation of her business rivals begins. For the time being, the low mark, franc and lira work havoc with English exports and home industries, but this situation cannot remain indefinitely. Indeed, it is a moot question whether the import of necessary raw materials—with conservation of home resources—is not to be welcomed, so long as the finishing remains for domestic labor.

When the inevitable deflation comes to the Continental nations, the manner in which this is carried out will determine the future business development of the countries involved. Repudiation of huge entities of paper currency will bring with it destruction of future credit, and since the position of Britain is sound in that respect, she has nothing to fear for her commerce and manufacture.

Hopeful for the Long Look

Sir Arthur Balfour, therefore, feels optimistic in regard to the industrial future of Great Britain in spite of the dark clouds which now envelop her productive classes. Force of circumstances will compel a rational solution of the Ruhr occupation difficulty and the eventual financial deflation of the nations badly needing this, with the return to reasonably normal conditions of personal effort in the near future, will allow the world to devote itself more effectively to the restoration of the moral ruin wrought by the great war.

President Samuel M. Vauclain of the Baldwin Locomotive Works says that shipments this year will approximate \$100,000,000. Orders for spare parts and repair work are heavier than any previous period this year. Plants are running at full capacity. Speaking of general conditions Mr. Vauclain said, "General business of the country is good. Basic conditions are very good."

French Automobile Manufacturer Installs American Equipment

Andre Citroen, France's well known production automobile manufacturer, has turned over the layout of his entire japanning plant and the designing of his complete equipment to the engineering staff of Young Brothers, Detroit.

When the three Citroen engineers who recently visited this country completed their tour and their study of American production methods, H. M. White of Young Brothers returned to France with them. As a result, the entire equipment of the japanning plant, with a capacity of 275 cars a day, will be designed by Young Brothers, according to the ideas worked out by Mr. White in consultation with the Citroen engineering and production staff, and will embody the best American experience adapted to local conditions in France. All parts requiring special equipment for their manufacture will be made at Young Brothers' plant and other parts will be made in France in accordance with blue prints furnished.

The only condition placed upon their work by M. Citroen was that he wished the plant to be the finest and most modern in France, and that the capacity must be 275 cars per day.

According to Mr. White, M. Citroen plans to open a plant in the United States. M. Citroen feels that there is a place in the American market for his car.

Committee on Russian Trade Formed

A committee on Russian trade with Henry T. Hunt, former member of the Railroad Labor Board, as chairman, has been formed. An effort will be made to enlist 2000 representative American manufacturers and export houses in the resumption of trade with Russia. The headquarters of the committee are at 120 Broadway, New York.

The committee, according to Mr. Hunt, is preparing an industrial report which will exhaustively describe Russian conditions. Among those conducting the investigation upon which the report is to be based are Valerian E. Greaves, former professor of law in the University of Petrograd, and Ellery A. Baker, formerly in charge of the industrial department of the National City Bank, New York. Cooperating with the committee are representatives of export bodies and trade associations including the American Manufacturers Foreign Credit Insurance Exchange and Lloyds of London. Monroe Curtis is aiding the work from Berlin. The committee, it is said, is studying the possibility of obtaining credit insurance on at least a portion of the shipments, and will make arrangements for financing. "The solution of this problem of Russian trade," says Mr. Hunt, "lies in proper organization. The committee, a non-profit body, will remain strictly impartial regarding all political conditions in Russia, and will take no sides with any of the existing Russian political factions."

President Crawford Heads Dock Commission

BIRMINGHAM, ALA., Oct. 1.—Governor W. W. Brandon, of Alabama, has appointed George Gordon Crawford, president of the Tennessee Coal, Iron & Railroad Co., chairman of the Dock Commission, to be in charge of the development of the port of Mobile. The voters of Alabama some time ago voted a constitutional amendment providing for \$10,000,000 credit of the State for the development of the port of Mobile and inasmuch as this port is nearer to the sea than New Orleans, it is expected ultimately that this will be one of the most important ports of the country. The Dock Commission will be charged with the organization of the forces which will map out and carry on the first development work, including the purchase of the water front and other preliminary work.

The development of this port, it is expected, will bring about great development plans on the part of the United States Steel Corporation, the idea being that the corporation will make this section one of its great exporting subsidiary centers.

Last Days of Foundry Congress at Paris

Plans Renewed for International Exchange of Views on
Testing Castings—Next Congress, Three Years
Hence, Likely in United States

(Special Correspondence)

PARIS, FRANCE, Sept. 16.—The session on malleable castings of the Paris convention of foundrymen was opened Friday, Sept. 14, with M. Cury, vice-president of the French Foundrymen's Association, in the chair. The first paper was by M. Piedboeuf on "Tensile and Transverse Tests of Malleable Castings." The author advocated sections of test bars which were "I" and cross-shaped and, as indicated by the samples passed around, did give excellent metal in the extremities of the section but were complete "shrinks" in the junction points. The paper provoked much discussion. The general thought was against changing from the wedge and standard American test piece. This was brought out specially by M. Rémy, and accentuated by Mr. Portevain, who also opposed the tensile test for cast iron, even if malleablized, as unreliable.

The next paper, by Mr. Gailly, went exhaustively into American malleable practice as seen by him on his journeys to the United States. A long discussion by Mr. Rémy ensued, in which he pointed out differences in viewpoints and practice—the two manufacturers of malleable castings in Belgium disagreeing considerably—Mr. Gailly favoring the straight American "black-heart" malleable. Dr. Moldenke was asked a number of questions on his practical experience in connection with malleable melting processes, particularly on the air furnace.

M. Perrin presented a paper on the electric furnace for foundry use. This was discussed by Mr. Lamballe and J. Léonard, and some information was given on nickel-chromium alloys added to heats of steel. Ivan Lamoureux, Liege, Belgium, then discussed the need of a dictionary of technical foundry terms, holding that there is great need for accurate definitions in the industry, and advocated work along this direction—in effect doing the same work as the American Society for testing materials through its committee on definitions. The applause given the speaker indicated that he had the appreciation of the assemblage.

M. Rémy then took the floor to advocate the forming of a European malleable association—on the lines of the American to some extent, so far as research is concerned. At the close of the meeting those who were interested remained behind to consider the question of organization.

Buying of Pig Iron by Analysis Recommended

The following is the text of the resolution passed by the congress in regard to the purchase and sale of pig iron:

Resolved: That the International Congress of Foundrymen, assembled in Paris, recommends that the purchase and sale of pig iron be conducted on the basis of its analysis.

That this should be done under appropriate regulations that will protect the buyer and seller on matters relating to methods of sampling and analysis; as also allowable variations from such analyses in the delivery of the pig iron specified.

The ladies were entertained during the day by a visit to the Eiffel Tower, at which the foundrymen met them for lunch, and later interesting points were visited by motor-bus. The foundrymen continued their visits to foundries. The establishments visited during the congress were the following: the steel casting plant of Noisy-le-Sec; the converter-steel casting plant of the Ateliers Nord-Paris à La Courneuve, and the iron, bronze and aluminum foundries of Forges et Fonderies de l'Aviation à Gennevilliers. These were covered in the trip of Thursday, and the converter-steel foundry of the Usines de Vitry-sur-Seine, and the foundry and molding machine shop of Ph. Bonvillain and E. Ronceray at Choisy-le-Roi were left for the Friday trip.

Regarding the exhibition this much can be said: While naturally not comparing in size with that of the American Foundrymen's Association, it was nevertheless a creditable showing of the state of the art of both foundries and equipment manufacturers. The character of the machines and appliances shown was high, and everywhere were seen the care and finish that had been given the design as well as the execution of the work. The exhibition was replete with examples of art casting, sections of automobile castings showing the intricacy of design, and the various raw materials entering the foundry. Particularly the fact stood out that few equipment houses confined themselves to one line of machinery or operating equipment. Molding machines, ladles, sand mixing machinery and tumbling barrels would be seen in one exhibit. One exhibitor even had a liquid to give air-dried cores—that is, without baking—provided, however, that only silica sand was used, as the presence of clay rendered the fluid ineffective. Probably some chemical like magnesium chloride or other artificial stone-forming solution is involved.

The exhibition had the great advantage of being located in one of the four great trade schools operated by the French Government. Hence a visit through the extensive shops and class-rooms was illuminating. The young men receiving instruction have to take a four-year course. Pattern-making, molding, machining and blacksmithing are taught thoroughly, as the fine exhibits of the work done amply testify. It is no wonder that the United States foundry industry has to look to Europe for a large portion of its future molders, as the larger countries of Europe are turning out proportionally far more trained mechanics than we are able to do with all our schools and plant training classes.

On Saturday, Sept. 15, was the closing session. This was presided over by Minister Gaston-Vidal, Assistant Secretary of State for Industrial Education, who had first made an official tour through the exhibition. The first paper of the session was by J. Galibourg and A. Brizon on the casting of bronzes and aluminum, which was briefly discussed. Then H. J. Maybery gave a brief resumé of his paper on magnesium in the foundry, which was followed by an elaborate address by Prof. Chevenard of the School of Mines of St. Denis, who went deeply into the expansion of irons under heat and the graphitization of cast iron.

In taking the chair at the opening of the session Minister Gaston-Vidal had given an excellent address on the importance of the mechanic arts to France and the world, and in particular the foundry, as requiring more specific instruction. He held forth the promise of a special institution for this purpose to be inaugurated by the state. The speech was of a patriotic character and called forth many bursts of applause. After the papers, the Minister distributed the prizes and medals incident to the congress. The presidents of the visiting associations each received a medal, and then the prizes for the best exhibits were given out—checks and medals. Then came the unique distribution of medals, cash prizes and books to the students in the trade schools who had achieved distinction. The smaller the boy the greater the applause he got from the assemblage. The congress then adjourned officially.

European Malleable Association Formed

It was learned that on the previous day there had been formed the European Malleable Association on technical lines only.

On leaving the place of assemblage the entire dele-

gation took a special Seine steamer for a three-hour ride down the river to St. Germain, where the magnificent collection of French antiquities, from the stone age and the Roman occupation, were exhibited in the palace, dating back to Francis the First. Return was had by rail, and shortly thereafter everyone went to the great banquet held in the Palace d'Orsay.

It should be mentioned that, according to Continental custom, every function connected with the congress was by ticket duly paid for by the participant—in distinction to the English custom, under which the guests found it difficult to pay out anything except the hotel bills. This Continental custom made it easier for the hosts in their arrangements, but also difficult for the guests in getting about. A case in point was the getting to the boat of 150 congress members from the distant meeting place—in taxicabs, not previously arranged for. Hence, some who vainly hunted conveyances for nearly half an hour were left behind. Unquestionably, however, the newness of the occasion made it impossible to provide for everything in advance.

The banquet was a grand affair. The director of technical education of France, M. l'Abbé, presided, owing to the unavoidable absence of the Secretary of State. Eight nationalities were toasted, and Mr. Clamer, president of the A. F. A., responded for America. It was shortly before midnight that the chairman, in clearer French than any of the previous speakers, struck the keynote of the whole occasion in urging constant attention to the apprentice problem.

Plan for International Study of Testing Castings

During the excursion to St. Germain the representatives of the various bodies interested in testing cast iron met in the cabin and discussed ways and means of carrying out the object in view. A loose organization was perfected, with M. Portevain as chairman and M. Ronceray as secretary, these gentlemen to serve as means of communication between single members for each country, to receive and transmit information. It was asked that each country send in their views on the subject of testing iron—under the resolution passed by the congress—for information and criticism, these views to be accompanied by the reasons and arguments for their presentation. This will give the start to those nations having done no testing work as yet, as well as clarify divergent views of those nations which have. It is hoped to have made considerable headway before the next congress—expected to be held in three years, and in the United States.

The American party will now break up somewhat, several going to Italy to attend the meeting of the Iron and Steel Institute in Milan. Others go to Switzerland and Germany, and probably most of the party to Belgium and the devastated battlefields.

(From Another Correspondent)

PARIS, FRANCE, Sept. 18.—So great was the success of the first International Congress of Foundrymen, that the chairman of the American representatives announced at the concluding banquet, at the Palais d'Orsay, that it was hoped to hold another conference in America in 1926. There were representatives from eight different countries. There were about 150 members of the Institute of British Foundrymen present and substantially the same number from Spain, as well as an influential body from America. Sweden and Czecho-Slovakia were also represented.

Sessions were held in French and English, the same papers being discussed. Nearly all the papers were contributed by American and English representatives.

Cast Iron and Mass Effect

The papers that were of the greatest importance were those on "Magnesium in the Foundry," by H. J. Maybery; "Mechanical Handling of Sand," by H. M. Lane, Detroit; "Testing Cast Iron," by Dr. Richard Moldenke, and "Cast Iron and Mass Effect," by O. Smalley, Newcastle, England. In the last paper the author was exploring what is almost virgin ground. He stated that he was not cognizant of any attempt at

systematic investigation of the mass problem. It assumes, he said, proportions of huge dimensions and presented a fertile field for research for which the contributed cooperative effort of many investigators was necessary to its scientific understanding.

The treatment of the subject was altogether comprehensive and the subsequent discussion chiefly centered on pouring problems. Mr. Smalley contended that the controlling influences in the manufacture of solid castings were (1). Time factor during solidification (2) Temperature of pouring. (3) Chemical Composition (4) Rate of cooling and (5) Rate of pouring. Dr. Moldenke explained the big influence on the solidity of castings of fluidity and Dr. Fletcher, late director of research of the British Cast Iron Research Association, stated that in his opinion thick or thin sections make or mar castings. In his opinion also the speed of running castings is of vital importance. The interesting statement was made by him that the British Cast Iron Research Association were giving special consideration to the question of mass effect. In replying to the discussion Mr. Smalley agreed that stability of the mold was important, but if the time taken to solidify was too long the metal should be dealt with and not the mold.

Magnesium is of great importance in engineering. It is often used as a deoxidizer for brass and steel. Mr. Maybery in his paper emphasized that it is as well when designing molds for magnesium alloys to remember the simple laws of hydrostatics. Magnesium alloys, he said, were more than four times as light as iron. Therefore it would require a column of molten magnesium four times as high to produce the same pressure as a similar column of molten iron. The point has to be borne in mind when designing runners and risers. Provided the metal supplied by the manufacturers is of suitable quality, there are no great difficulties with magnesium alloys in the foundry.

International Tests for Cast Iron

Dr. Moldenke's paper provided the basis of an interesting discussion, unfortunately as fruitless as similar discussions have been in the past, in consequence of which a resolution to form an international committee to divide research work on testing among the different countries in order to get testing on a recognized basis was not proceeded with. [The preceding report shows a later informal attempt at establishing a plan which promises some success.]

The French method, invented by Fremont, was severely criticized, especially by British representatives. Mr. Ronceray, a French engineer and foundryman of high repute, praised the French method, which had been proved since the war, he said, more satisfactory than casting separate bars or bars on castings, the small rods thus obtained being subsequently prepared for shearing tests.

The American arbitration bar dates from 1905 and, in Dr. Moldenke's opinion, it is in every respect satisfactory except as to length, which is one foot. American engineers and foundrymen are now ready to consider the lengthening of the bar and are anxious for international action.

A point that is much discussed is whether test bars should be cast flat or on end. Dr. Moldenke explained that the American arbitration bars were cast in the vertical position. Before he replied and explained that the arbitration bar was only used when there was a dispute and that in America no specifications were issued for light castings, a trenchant criticism of both French and American methods was made by J. Shaw, Sheffield. He said that the conditions differed in England from America. In England the engineers dominated the position.

Industrial units in the Mahoning Valley now nearing completion include the mechanical puddling plant of the American Puddled Iron Co., coke oven extension of the Republic Iron & Steel Co., new by-product coke plant of the Trumbull-Cliffs Furnace Co., and a new plant at Haselton for the Standard Slag Co., for the reduction of furnace slag. Operation of these plants will add several hundred men to the payroll of the district.

Electric Brass Foundry Practice

American Electrochemical Society Holds a Notable Session—All Phases of the Industry Represented—Power Rates and Refractories Discussed

AN innovation, in the form of an unusual round-table discussion, was the feature of the forty-fourth general meeting of the American Electrochemical Society, held at Dayton, Ohio, Sept. 27 to 29. It was one of the most profitable meetings of this kind. Its success was due to two causes: The complete plans prepared for insuring the attendance of interested parties and the understanding that each speaker would be free to speak his mind with the assurance that the proceedings would not appear in the society's *Transactions* nor taken down by stenographers or publication representatives. The technical press was requested to cover only generalities.

A New Kind of Meeting

The meeting was a group luncheon. The general discussion was held under the auspices of the electrothermic division of the society. The subject was "Electric Furnace Brass Foundry Practice," one which is of large importance and which is attracting wide interest among brass manufacturers, particularly the operation of different kinds of electric furnaces under varying conditions. It was expected by the organizers of a meeting of this character that viewpoints could be exchanged more openly, with the result of a better understanding among both producers and users of such furnaces. This was fully realized. There was also the added advantage that, for the first time at any such meeting, representatives of central power station companies were present to express their views or to answer questions.

The attendance at this round-table luncheon, held at the Engineers' Club, Thursday noon, Sept. 27, far exceeded the most optimistic expectations of the organizers. The most exaggerated prediction was an attendance of 50, but at least 80 to 85 actively interested participants were present. The diversity of interests in electric brass foundry practice represented almost every important district of the country. Users of electric brass furnaces from the Ansonia and Bridgeport, Conn., districts; the Rome, N. Y., territory; the Buffalo, Detroit, Cleveland and other important centers were represented. Companies interested in selling special types were also represented. Many of the large power companies in certain districts, such as Detroit, Dayton, Cincinnati, New York and other centers, sent men particularly acquainted with the furnace or power load phase of the problem. The result was an aggregation of men informed in all aspects of the subject, and ready and free to discuss almost any topic.

No small amount of the success of this notable meeting is due to the chairman, Dr. H. W. Gillett of the Bureau of Mines Station, Ithaca, N. Y. His management of the session, reinforced by his intimate knowledge of the industry, was a large factor.

Four general topics were discussed in about the following order: Power rates in various localities, including the question as to at what rates can an electric furnace show a saving; large furnaces versus small furnaces; types of furnaces best suited for different purposes; operation of furnaces more than one shift per day; and refractories.

Power Rates in Various Localities

From representatives of power companies and from users of electric furnaces, the actual rates in force in various parts of the country were made public, as well as the conditions surrounding the use of this power. It developed in general that there is not such a large variation in power rates as was expected by many and that there is an eagerness on the part of many power companies for just such a load as the electric brass furnace demands. It was also evident that not only is

electricity very widely used for electric melting and refining furnaces, but also that in the brass industry it is not a prohibitive fuel even at some of the higher rates, because of certain accompanying advantages, such as better product, less metal loss, etc.

Refractories for electric brass furnaces was the next most important phase of the session. The inability to secure certain refractories for some kinds of brass melting furnaces is a problem needing early solution. Various experiences and suggestions were fully discussed, but it did not develop that this problem has been solved. It was the sense of the meeting that faster progress should be made and it was recommended that the society as an organization cooperate with the American Ceramic Society, the Bureau of Mines and other organizations in an effort to clarify the situation.

There was a most interesting exchange of opinions as to various types of furnaces, their advantages and limitations, as well as the kind of work they are particularly adapted to. Unusual frankness pervaded the exchange of views. An announcement of interest was that of Dr. E. F. Northrup, Ajax Electrothermic Corporation, Trenton, N. J., that his company has recently perfected a hydrogen gap which he reports greatly simplifies the operation of his high frequency, high temperature electric melting furnaces.

There were among those present some who are contemplating the introduction of brass melting equipment, fuel or electricity. The interest in the session was so intense that it lasted two or three hours longer than scheduled, over 75 per cent of those present electing to forego some of the entertainment features in order to prolong the discussion. So notable was the success of this new kind of gathering that it will be continued at one or both of the next two conventions, which are planned for the spring and fall of 1924.

Plant Visitations and Future Meetings

Besides the brass session there were other round-table luncheons devoted to special electrochemical subjects, as well as regular technical sessions, the most important of which was a symposium on "Electrochemistry of Gaseous Conduction," of which Dr. Duncan MacRae was chairman.

Among plant visitations were those to the General Motors Research Laboratories, the Duriron Castings Co. and the National Cash Register Co. At a smoker and entertainment at Triangle Park, Thursday evening, Sept. 27, Charles F. Kettering of the General Motors Research Corporation delivered a scholarly address on the general subject of research, its misconception, limitations and objects.

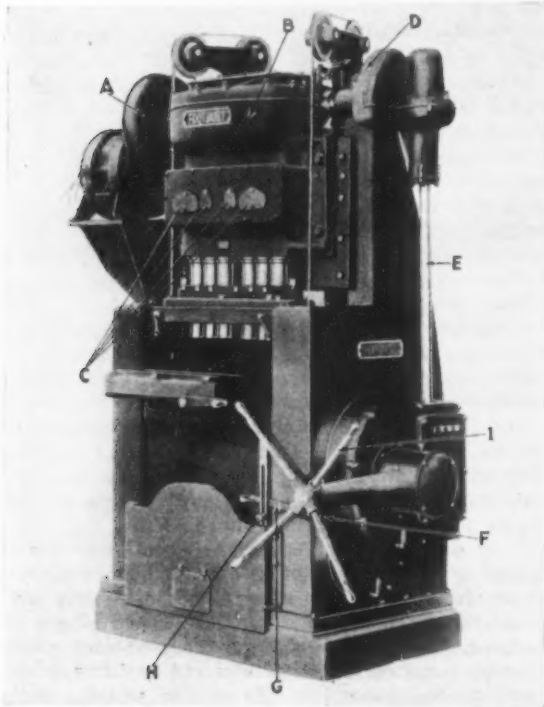
The 1924 spring meeting of the society was announced as arranged for Philadelphia in April and the fall meeting for Detroit, probably in September. The Dayton convention was remarkably well attended, having a registration of nearly 200, or practically equal to the New York meeting last May.

A two-semester course in Industrial Metals and Alloys will be added to the courses in evening studies at the University of Buffalo if a sufficient number of registrations are received. University authorities have approached district iron and steel executives and have asked them to ascertain sentiment on the proposed course. David A. Waite, consulting chemist and metallurgist will be in charge. The object of it is to familiarize men who are not metallurgists, but who are dealing with metals, with the physical and chemical properties of the important metals and alloys. The plan calls for registration of purchasing agents of steel, salesmen and automobile manufacturers.

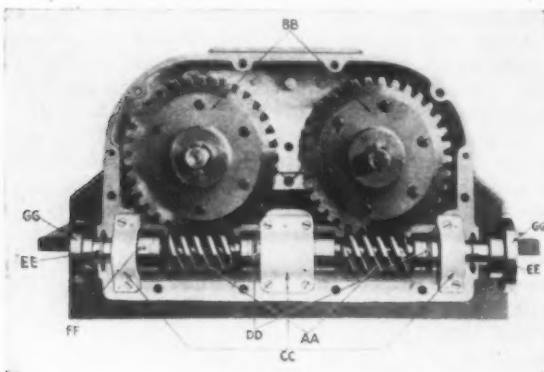
IMPROVED BORING MACHINE

Multiple Spindle Unit for Quantity Production— Interchangeability of Heads a Feature

The Foote-Burt Co., Cleveland, has placed on the market the multiple spindle boring machine illustrated, which is for use in boring and reaming automotive cylinders and for miscellaneous boring operations on a range of other work, the machine being an improvement over the company's previous equipment for the same duty.



The Spindles Are Set at Fixed Center Distances and the Feed and Speed Worked Out for the Particular Job. Interchangeability of heads and jig plates provides for using the same machine on different boring jobs. The drive to the spindle is shown in view below



Being intended for use where parts are to be machined in quantity, the spindles are set at fixed centers and the speed and feed worked out for the particular job. To adapt the machine for use where it is desired to run two or more boring operations on the same machine, the heads are made detachable and are bolted to the rail, which is provided with T-slots. To change the heads, it is merely necessary to loosen the bolts and dowel pins and disconnect the couplings which connect with the main drive of one side of the machine and with the feed mechanism at the opposite side. Another head is then placed on the machine and the drive arrangement coupled up again. The jig plate holding the bushings for guiding the spindles may also be easily interchanged.

The machine may be arranged for either belt or in-

dividual motor drive, the latter being mounted on a bracket on the column, as shown. The drive is from the motor through reduction gears at A to a main driving shaft in the head. There are two worms, shown at AA in the separate illustration, mounted on a main driving shaft, which transmits the motion to two worm wheels BB, located near the top of the gear case B.

The following description applies to a six-spindle head, but a similar arrangement is employed for other numbers of spindles. For the six-spindle machine each worm wheel is mounted at the top of the middle of a group of three spindles, and under the worm wheel is arranged a spur gear, which transmits power to spur gears mounted at the top of each of the other two spindles in the same group. These spur gears have their faces divided into two sections, the teeth on one of the sections being of a coarse pitch to carry the load, the other section of the same gear being provided with teeth of a finer pitch to divide up the points of contact, which is intended to assure a smooth running drive. The main driving shaft carrying the two worms AA is mounted on roller bearings, and is also provided with ball thrust bearings to carry the end thrust of the worms. Each spindle is carried by adjustable tapered bronze bearings, and the endwise load is taken by all thrust bearings. The spindle head is lubricated by a force feed system.

Feed Accomplished by Raising Work Table

In this design the head occupies a fixed position, and the feed is accomplished by raising the work table. Four feeds are provided by means of two sets of pick-off gears, mounted in a gear case D, in which all of the mechanism runs in oil. Power is taken from the main driving shaft in the head and carried through the spur and bevel gears to the vertical shaft E, at the lower end of which there is a knockout worm meshing with the worm wheel. On the worm wheel shaft there is a spur gear meshing with the worm wheel, on the shaft of which there is a spur gear meshing with a second gear carried on the shaft running transversely through the machine. This shaft carries pinions with racks at either side of the table, so that their rotation causes the table to be raised and carry the work up to the tools in the spindles. Raising the hand lever F throws the knockout worm into engagement with the wheel and makes the power feed operative. When lever F is raised, it is latched at the upper end of bell crank G, and when in that position holds the worm in engagement with the wheel, resisting the tension of a spring which tends to throw the worm out of engagement.

Attached to the work table there is a slotted bar, on which the feed trip H may be set in any desired position. When the table is fed upward to the end of its stroke, the trip H engages the lever G, and by rocking this lever causes the latch to release hand lever F. Then the spring throws the worm out of engagement with the worm wheel and stops the feed. Capstan wheel I provides for adjusting the position of the table by hand. The table is counterweighted, steel cables connected with the table serving to carry the counterweights, which slide on cylindrical guides mounted at the back of the machine.

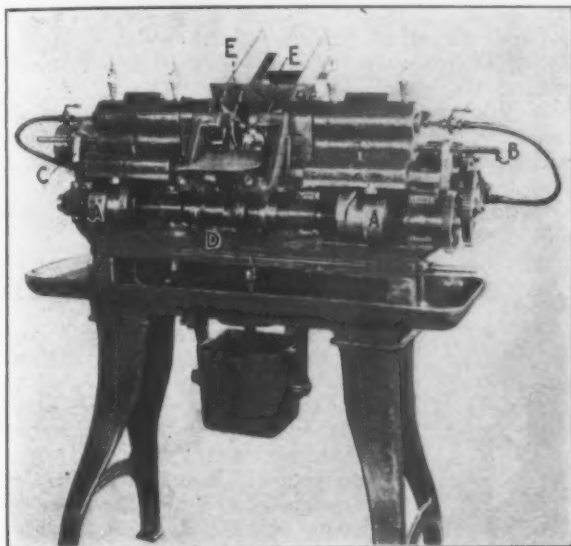
The growing tendency among retailers to increase their rate of turnover through buying in smaller quantities is likely to require more convenient wholesale sources of supply to facilitate prompt deliveries, declares a pamphlet issued by the Domestic Distribution Department of the United States Chamber of Commerce, Washington, and available now for distribution. This report urges more familiarity with scientific warehousing as a means for lowering the costs of distribution and recommends that merchants and manufacturers shall study their peculiar problems and their possible relation to public warehousing.

A competitive examination for assistant mechanical engineer to fill a vacancy in the Bureau of Aeronautics, Navy Department, has been announced by the United States Civil Service Commission, Washington, to which applications should be made prior to Nov. 6.

Double-End Machine for Production Threading of Studs and Rods

A machine for simultaneously threading both ends of studs and rods and which is entirely automatic in its operation, fitting it for work on a quantity production basis, has been brought out by the Grant Mfg. & Machine Co., Bridgeport. The production claimed in threading $\frac{3}{8}$ -in. rods on both ends to a length of $\frac{1}{2}$ in. is 30 rods per min. The capacity of the machine illustrated is for work of $\frac{3}{8}$ -in. diameter and 10 in. long.

The threading is done by two opposing die heads mounted on the heads and moving longitudinally along the bed. The work is fed intermittently from a magazine at the rear to a position in line with the die heads



The Threading Is Done by Means of Two Opposing Die-heads. The machine is entirely automatic, work being fed from a hopper and discharged into chute when completed

and is clamped by means of levers. The movement of the levers, the traverse of the heads and the operation of the work carrier are by means of cams. Power is transmitted through a two-step cone pulley on the driving shaft, from which each head is driven by a train of spur gears. The die head spindles are hollow and lubricant is pumped through them to the ends of the work.

The cam-shaft extends along the front of the bed and is driven from the driving shaft by means of gears. The cylinder cams A A, mounted at each end of the cam-shaft, carry cam blocks for controlling the forward and return movements of the heads by engaging a roller on the bottom of the heads. The cam blocks are changed to suit threads of different pitch, but change gears may be used also to obtain the proper rate of forward movement of the heads relative to the rotation of the spindles.

In addition to controlling the rate of traverse of the heads, the cams also control the length of their movements. The positions of the cams are adjustable to suit the length of work by means of a thread and locknuts. Obviously the positions of the cams control the positions of the heads. Threads of different lengths may be cut by providing cam blocks to suit. The opening and closing of the die heads is accomplished by means of rods B, and two adjustable stops on each rod. The rods extend through the heads and are connected to the die heads by a fork. At the end of an operation the forward movement of a rod ends as the rear stop comes in contact with bracket C, which causes the die head to open. At the ends of the return movement of the head the second stop strikes the other end of the bracket and closes the die head.

Work is delivered from the magazine to the threading position by means of cam D, which actuates a roller attached to the front end of a link extending to the rear of the machine. At the rear end the link is connected to a bell-crank, which is in turn fastened to a vertical rod having a pawl at the upper end. The pawl engages a ratchet on a shaft which carries two

disks, E E, and causes the shaft to rotate intermittently when motion is imparted to it from cam D. Each disk has six notches by means of which a piece is carried from the magazine each time the pawl rotates the ratchets.

When in the threading position the work is clamped by means of levers which are rocked forward by the movement of cams. As the rollers ride on the low portion of cams, the levers swing forward again and release the work, which rolls forward into a receptacle provided. Provision is made against the possibility of breakage due to improper clamping of oversize work.

New 21-In. Upright Drilling Machine

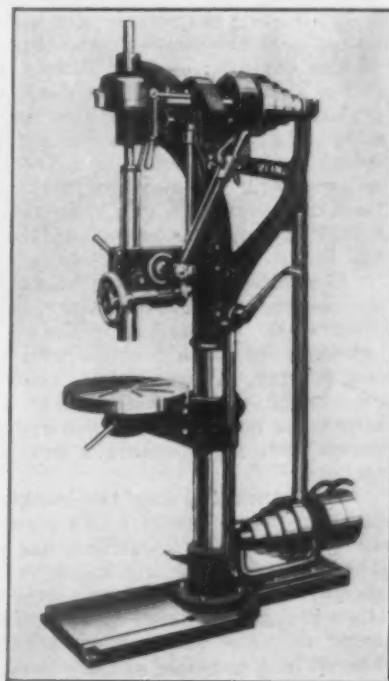
A new model 21-in. upright drill with gear driven feed has been placed on the market by the Buffalo Forge Co., Buffalo. Departures from its previous machines are in the use of a positive gear feed instead of belt driven, and the placing of a brace between the lower pulley shaft and the upper part of the frame. The machine is available, however, without the brace attachment if desired.

The general construction of the machines may be noted from the illustration. The drill has eight speeds with use of back gears, three power feeds, hand wheel and ratchet lever feeds. A feature of the power gear arrangement emphasized is the type key spring installed, a spiral spring being used in place of the semi-elliptical type, which is said to provide uniform and maximum pressure to the key in all positions. The spiral spring employed in the new machines consists of fourteen coils of music wire, 0.023 in. thick.

All feeds are obtained without stopping the machine. Quick adjustment from plain to back-gear drive may be had by disengaging the knurled knob in the top gear and throwing in the back gears by means of a hand lever. A lock screw serves to hold this lever in place. An adjustable trip is provided by which the power feeds are thrown out when the piece has been drilled to the required depth. All gears are machine cut and are bronze bushed, and the main feed worm runs in an oil bath.

The spindle is of high carbon steel and is accurately ground. Spindle thrust is taken up by means of ball bearings, and plain spindle bearings are split. The head and column are cast as one unit, the column itself being machined and highly polished. The vertical travel of the spindle is $12\frac{1}{2}$ in. and the maximum distance from the base to spindle is 39 in. The table of the drill, carried on the main column, is operated by a screw of the ball thrust type which is lathe turned. The table arm is bored by the machine itself, which is intended to assure close accuracy. The maximum distance from the spindle to table is 22 in. and the diameter of the round table is $16\frac{1}{2}$ in. A tapping attachment of the double-jaw clutch type is available if desired.

The capacity of the machine is for holes up to $1\frac{1}{2}$ in. The weight is 970 lb. and the floor space required is 16 x 47 in.

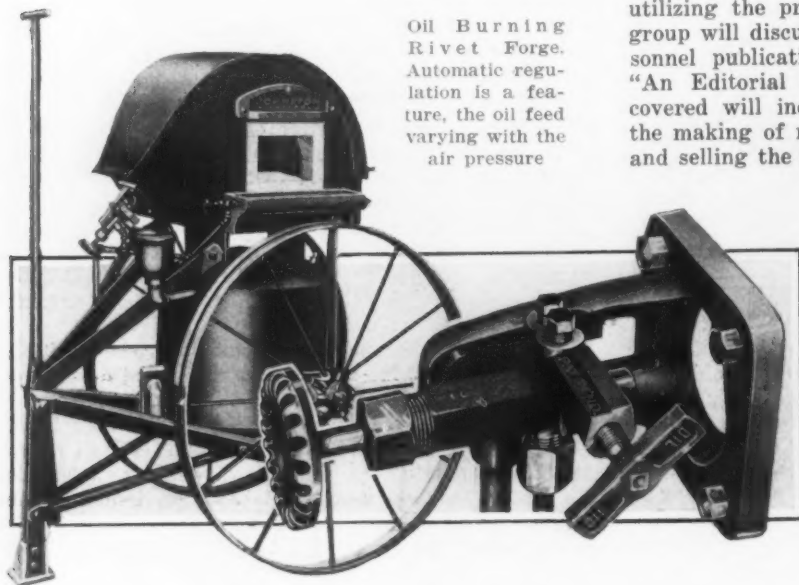


Positive Gear Feed Is Employed. Feeds are obtainable without stopping the machine

New Line of Rivet Forges

A new line of oil-burning, wheel-portable rivet forges, designated as Nos. 1, 2 and 3, for use in car repair yards, structural and boiler shops, respectively, has been placed on the market by the Johnston Mfg. Co., Minneapolis.

The general construction may be noted from the accompanying illustration. The frame is built on the "triangle" principle to permit of maximum rigidity, and the tongue is pivoted and acts as a guard for the burner. A large foot is provided to prevent sinking in soft ground. The wheels are 34 in. in diameter and 3 in. wide and are mounted in roller bearings. The forge is designed to burn fuel oil or any lighter oil. The automatic oil regulation provided is emphasized as maintaining a constant character of flame, eliminating scaling and smoking due to variable air pressure, and



Oil Burning Rivet Forge. Automatic regulation is a feature, the oil feed varying with the air pressure

maintaining high combustion efficiency. The entire floor of the heating chamber is visible to the operator as he stands normally, without stooping.

The charging opening is 6 in. wide and 5 in. high and is said to maintain its shape and size for a long period, thereby saving oil and maintaining best operating conditions. An air curtain pipe is provided to deflect the hot gases upward. The forge is designed for relining with standard firebrick or special tile. The tank capacity is 20 gal. The floor space occupied is 2 ft. 9 in. by 3 ft. 10 in. and the shipping weight is 825 lb.

The burner employed, designated as the Johnston non-clogging vacuum oil burner, is shown in the insert illustration. In this burner the oil supply is regulated indirectly by an air valve, which, it is said, cannot clog or vary, it being claimed that the burner operates continually without clogging or varying on oil containing so much free carbon and dirt that the usual burner will not maintain a fire without constant attention.

The burner has only two working parts, two needle point air valves, one of which regulates the compressed air and the other regulates the oil feed indirectly. The oil regulating air valve is plainly marked as shown, and is operated in the same way as other valves. High vacuum and large oil connections are provided in order that the burner may handle thick heavy oils. The oil feed increases and decreases automatically with the air pressure, and uniform flame is said to be maintained regardless of large variations of pressure in the air lines. The elimination of the necessity for readjustment of the oil feed, thus leaving the operator free to assist in other work, is a feature emphasized.

B. J. Mockenhaupt & Co., 217 North Des Plaines Street, Chicago, have been appointed sales representatives in the Chicago district for the Reinforced Switch & Mfg. Co., Inc., Pittsburgh.

To Discuss Plant, Sales and Office Management Problems

A variety of subjects bearing on plant, sales and office problems, with employer-employee relationship outstanding, will be discussed at the second annual meeting of the American Management Association, which will be held at the Hotel Astor, New York, Oct. 29 to 31.

Committee reports will be presented and discussed at three simultaneous meetings held Oct. 29. The subjects taken up by one group will include selecting employees, economics for employees, job descriptions, and man specifications, bases of remuneration, and co-operation with engineering colleges. Another section will discuss tendencies in training methods, coordination and administration of benefits, the scope and management of medical departments, the relation of community to personnel problems and distributing and utilizing the product of the public schools. A third group will discuss the report of the committee on personnel publications, the topic of the meeting being "An Editorial Program and Policy." The subjects covered will include the fundamentals of journalism, the making of magazine layouts, interesting the home, and selling the magazine.

Three simultaneous sessions will be held the second day, under the auspices of the office executives division, the plant executives division and the sales executives divisions respectively. The program of the plant executives division will include a report on apprentice systems, and an address on the "Relation of the Employment Department to the Foreman," by S. R. Rectanus, assistant works manager, Ashland division, American Rolling Mills Co., Middletown, Ohio. "Labor Efficiency in Good and Bad Times" will be discussed by N. I. Stone, general manager Hickey Freeman Co., Rochester, and "Following Up Foreman Training," by A. H. Young, manager of industrial relations, International Harvester Co., Chicago. A committee report on the training of salesmen will be presented and discussed at a meeting of the sales executives division, the six topics planned including among others the starting of new salesmen, coaching the salesmen in the field and the preparation of sales manuals. At the annual dinner, to be held Oct. 30, there will be several addresses on "Stabilizing Prosperity in America."

A session devoted to personnel administration in companies with 1000 or less employees will include committee reports and addresses on training, employee service, safety, health, employee contracts and employment. Simultaneously another group will discuss committee reports on "Devices for Conferring with Employees" and "Selecting the Supervisory Forces." Special luncheon meetings will follow.

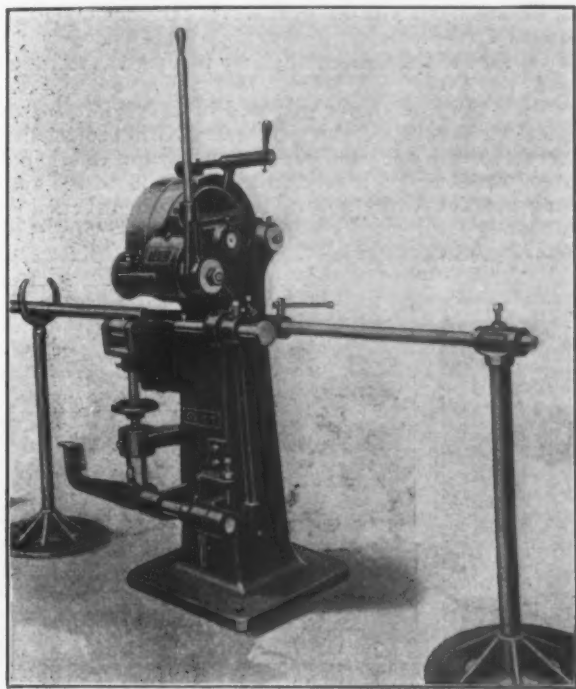
The closing sessions will include an address on "Supervision and Discipline, Their Nature and Importance," by Elisha Lee, vice-president Pennsylvania Railway System. "Using the Motion Picture in Personnel Work," another topic planned, will include a motion picture prepared under the auspices of the committee on visualized training. An address will also be made by Sam A. Lewisohn, vice-president Miami Copper Co., New York, on the subject of "Estimating Managerial Achievement in Terms of Human Organization."

The foundry department of the Christopher & Simpson Iron Co. on Park Avenue, Eighth to Ninth Streets, St. Louis, has been sold to a new company known as the City Foundry Co., of which U. S. Arnold is manager.

The American Sintering Co. has awarded contracts to double the capacity of its plant at Hubbard, Trumbull County. Improvements contemplated will involve expenditure of approximately \$200,000.

Heavy-Duty Roller Pipe Cutter

A heavy-duty roller pipe cutter incorporating improved features and having a range from $\frac{1}{4}$ to 2 in. inclusive, has been placed on the market by the Geist Mfg. Co., Waynesboro, Pa. In this machine the cutter is of tool steel, heat treated, and may be reground when dull. The cutter shaft bearing is provided with an adjustable cap on the cutter side, for taking up wear, which is emphasized as a distinctive feature adding greatly to the life of the machine.



Roller Pipe Cutter. The cutter is of tool steel and the cutter shaft bearing has an adjustable cap for taking up wear

The rollers are of tempered tool steel and are carried in roller bearings. The cage which supports the rollers is elevated to the cutter by a cam which is operated jointly by a pedal and a lever. A flexible guard is provided to protect the surfaces of the sliding cage from scale and dirt. The rollers are adjustable for the different sizes of pipe, the adjustments being obtained by means of the hand-wheel just below the rollers. The lever and pedal may be positioned to suit the convenience of the operator. Their movements are limited by an adjustable stop. A small cage of rollers for $\frac{1}{4}$ to $\frac{3}{8}$ in. pipe may be attached to the large cage without removing the regular rollers.

The length gage is adjustable for the different sizes and lengths of pipe, and may be used for lengths up to and including 4 ft. The parts coming in contact with the revolving pipe are hardened to resist wear, and the gage arm is a heavy casting to resist flexure. All spindles and shafts are ground and run in bronze bearings. Although fully inclosed the gears are conveniently accessible.

The machine is being sold by the Landis Machine Co., Waynesboro.

The Ford Motor Co. has placed orders for two lake boats which will be used in carrying iron ore from the Lake Superior district mines to the Ford plant at River Rouge. One of the boats will be built by the Great Lakes Engineering Works at its Ecorse yard, Detroit, and the other by the American Shipbuilding Co. at its Cleveland or Lorain yard. These boats will be 611 ft. over all, 62 ft. beam and 32 ft. deep. They are the first freight boats ordered from lake shipyards for 1924 delivery. The engines will be of the direct Diesel type and the boats will have twin screws. They will be equipped with electrically operated winches and steering gear and an electric device for shifting the hatches.

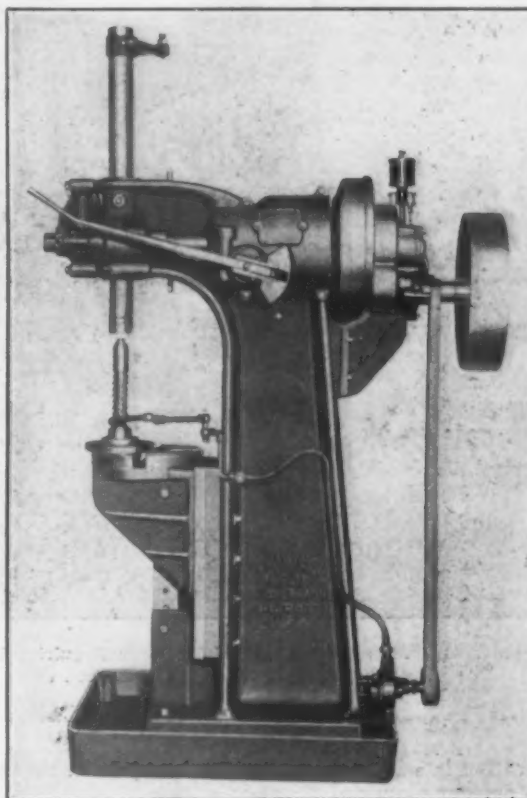
Combination Power and Broaching Press

A combination vertical broaching machine and three-speed power press incorporating improved features is being placed on the market by the Hercules Mfg. Co., 446 Woodbridge Street, East, Detroit.

The machine is rated at 15 tons capacity, and the ram is 36 in. long, 3 in. in diameter and has a travel of 24 in. The floor space occupied by the machine is $2\frac{1}{2} \times 4\frac{1}{2}$ ft. The knee may be removed to permit the use of special fixtures. The trip arm is adjustable and may be set to stop the ram automatically at a predetermined point.

Power to the ram is through a series of steel gears and a double friction clutch by means of which pressure from zero to capacity may be obtained. The fast speed of the ram is 50 ft. per min. up and down, the pressure feed down being 84 in. per min. for heavy duty. All speeds are controlled by a single lever. The machine is self-contained and is equipped with reservoir in the base, pump and standard equipment. It is adaptable to either belt or motor-drive.

Broaches are made with 60 deg. ends to which adapters are fitted, and arrangement said to give proper alinement and to reduce breakage of tools. In



Combination Broaching Machine and Power Press. Fast speeds, heavy cuts and less tool breakage are emphasized

broaching, the greater production due to fast speeds of the machine, and heavier cuts and smoother work due to gravity lubrication are advantages.

New York City's first brass mail-box was installed Sept. 29 on lower Broadway, near Wall Street. The Post Office Department is placing boxes of this construction in seacoast cities. Protective green paint is not regarded as necessary and the boxes will retain their shape and lettering as a means of identification. The boxes are made at the Navy Yard at Washington.

Increased industrial activity in Iowa was reflected in the August survey of employment conditions in that State recently issued by A. L. Urick, commissioner of labor. Reports from 352 companies showed an increase of 1.7 per cent in the number of employees over July, and a 16.4 per cent increase over August, 1922. The largest gain in employment over July, 119.1 per cent, was made in the refrigerator industry.

TWIN-RAIL LONG REACH PLANER

Machine Developed for Planing Inclined Sides of Steel Safe Doors—Heavy Cuts Taken

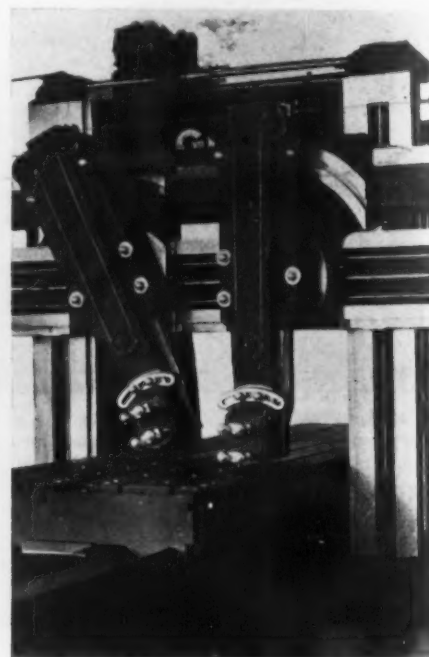
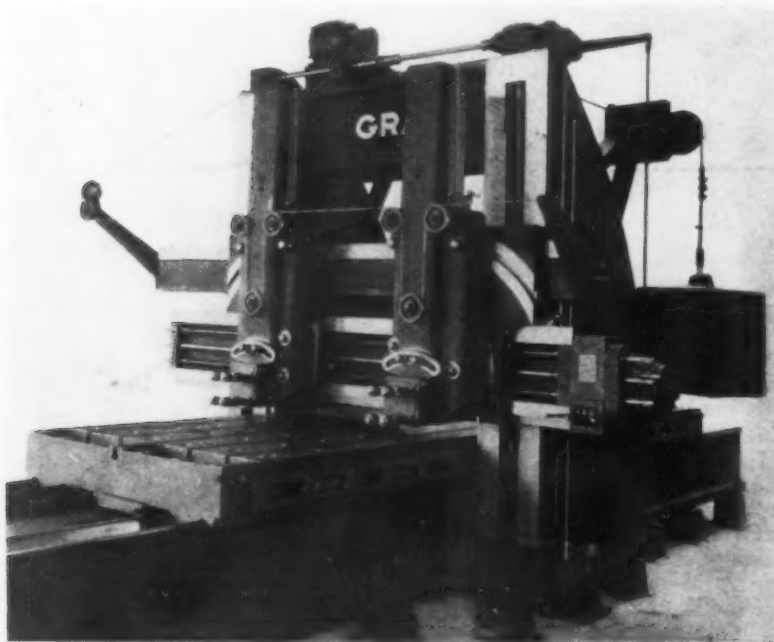
A new planer, designated as the "twin-rail, long reach, maximum service planer," and intended for work requiring longer reach than is available with the usual standard planer, combined with heavy cutting, has been placed on the market by the G. A. Gray Co., Cincinnati.

The machine illustrated, which was built for the Mosler Safe & Lock Co., Hamilton, Ohio, is 60 in. x 44 in. x 16 ft. in size and is used for planing the inclined sides of steel safe doors up to 30 in. thick. The planer was designed to take heavy, wide forming cuts in the steel without chatter, 30 in. below the bottom of the rail. The massive proportions of the machine may be noted from the weight of the various units, the bed weighing 14 tons, the table and rack 10 tons, the housing 6 tons, the rail 6 tons and the top brace 1 ton.

on the lower ends of the rams. The rams have rapid traverse as well as hand and power feed through the ram carriers. As the ram carriers can be swivelled, the rams have automatic feed in any direction.

To swivel the heads quickly, a simple but effective method is employed. As shown in the illustration, a bar is slipped over the collars provided on the heads. The left-hand ram carrier is then loosened and the right-hand head is moved by power traverse. This causes the left-hand ram carrier to swivel. Having secured an approximate setting with the traverse, the operator can get a very accurate setting by moving the right-hand head with his crank. He can then clamp the left-hand ram carrier, loosen the right-hand one, and swivel that to the desired angle by moving the left-hand head.

"Twin purpose" taper gibs add to the rigidity of the heads while cutting. One of these gibs is provided between the ram and ram carrier. A turn of the handle in one direction positively adjusts the gib to the operating position while a turn in the other direction se-



Planer with Twin Rails, Intended for Work Requiring Longer Reach Than Available with Regular Planer, Combined with Heavy Cutting. The method of swiveling a head is shown in right hand illustration

Operation is said to be as quick and easy as in the case of a smaller planer of the regular type.

The rail is built up of two members, as shown, bolted together and moving as one unit. The saddles have a solid bearing against the bottom of the lower member, an adjustable gibbed bearing on its top surface, and a supplemental bearing against its rear face. The saddles also have an adjustable gibbed bearing against the rear of the upper member of the rail. The top and bottom bearings of the saddle are thus localized on the lower member, an arrangement intended to provide the advantages of a narrow guide, while the bearing against the rear of the upper member gives the stiffness required for the machine.

Three ball bearing rollers are provided in the top of each saddle, so that most of the weight of the heads comes on the upper rail member. This obviates deflection of the lower member, which is said to remain straight and true, so that the head always moves exactly parallel to the table top. At the same time the effort of moving the head is reduced so that the operator can easily set the head with the ordinary crank from the end of the rail.

The ram carriers can be swivelled on the saddles, and as shown are bolted not only to the lower portion of the saddles, but also to a supplemental support near the top of the saddles. The steel tool boxes are mounted

curely locks the ram to the ram carrier throughout the entire length of the carrier. A similar "twin purpose" taper gib is provided between the saddle and the rail.

The rams and heads can be traversed by power by means of the single shift rapid traverse that characterizes the company's regular line of maximum service planers, and which has been previously described in THE IRON AGE. The new planer is also equipped with the company's "cantslip" feed and the balanced helical driving system running in oil. Both the lower and upper members of the rail are clamped to the inside of the housings by independent rail locks. The rams and rail are independently counterbalanced and move very easily. The table is provided with steel hold-down gibs running its entire length and automatically oiled from the constant pressure forced lubricating system that oils the Vs. The bed is double length, so that the table never overhangs.

A competitive examination for valuation engineer and for associate valuation engineer to fill vacancies in the technical staff of the Income Tax Unit of the Bureau of Internal Revenue, Treasury Department, has been announced by the United States Civil Service Commission, Washington, to which applications should be addressed prior to Dec. 28.

Export Field for Iron and Steel

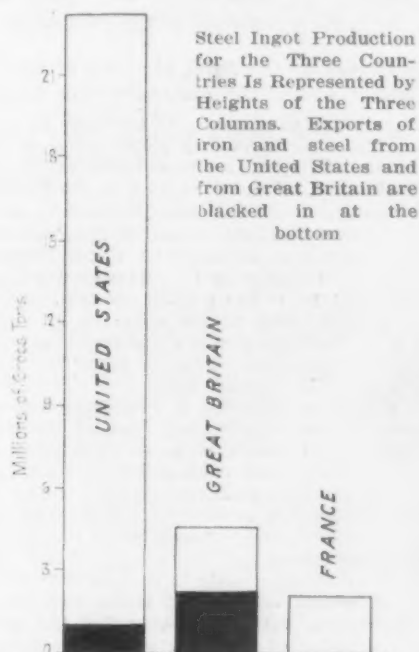
Great Britain Shipped Abroad Nearly Half Her Steel
Output of First Six Months—United States,
Less Than 4 Per Cent

BY M. H. BLETZ*

IN press and journal reports from principal producing and consuming countries of iron and steel it is generally acknowledged that there is a world shortage of steel products. Certainly it is conceded that the domestic demand, except in the United States and Germany and to a certain extent in the United Kingdom, France and Belgium, has fallen off. New developments of resources which would require the use of vast quantities of steel have been held up. Replacements

000 tons of steel, while the corresponding figures for Luxemburg were 320,000 and 172,000 tons. These two units in the secondary group are mentioned in this discussion, due to the fact that, though their production is low in comparison with the first group, their exports take a stronger position.

Domestic demand in the United States has left little for export—less than 4 per cent—even at the record rate of output in this country. The figures for the



and repairs to existing equipment have been kept at a minimum.

The United States, as the greatest producing nation of iron and steel, is followed in order by the United Kingdom, Germany and France. It is not possible to say at this time which of the two—Germany or France—has the greater capacity but, if that of the Ruhr is added to the French, it is safe to say they are about equal. Belgium and Luxemburg fall into a secondary class as to volume of possible production, when compared with the main group.

From production figures reported for the first half of 1923, we can judge what three of the primary units have done. Accurate data for Germany are not available.

Iron and Steel Production (Gross Tons)				
First six months of 1923				
	Pig Iron		Steel Ingots	
	1st quarter	2nd quarter	1st quarter	2nd quarter
United States...	9,747,659	11,093,875	11,324,141	11,889,102
United Kingdom	1,744,900	2,059,300	2,243,700	2,338,100
France	1,090,440	1,150,500	997,370	1,152,550

July figures indicate that this rate of output is being maintained. The production of pig iron and steel ingots for July is reported as follows, figures in parentheses being for steel ingots: United States, 3,678,334 (3,515,966); United Kingdom, 655,100 (624,300), and France, 430,000 (393,200), all in gross tons.

Belgian production for the first quarter of 1923 was approximately 475,000 gross tons of pig iron and 485,-

*Iron and steel division, Department of Commerce, Washington.

DISTRIBUTION INTO COUNTRIES OF IRON AND STEEL EXPORTS

In Gross Tons—First Half of 1923

Countries	From United Kingdom		From United States	
	1st Quarter 1923	2nd Quarter 1923	1st Quarter 1923	2nd Quarter 1923
United Kingdom.....	.....	.....	15,711	17,234
United States.....	143,659	88,359	.....	.....
Canada.....	18,634	34,021	184,301	221,803
Belgium.....	36,356	43,686	1,846	2,561
Denmark.....	13,734	14,831	(1)	(1)
France.....	30,534	43,439	2,557	2,859
Germany.....	40,507	86,816	(1)	(1)
Italy.....	26,686	24,345	622	1,784
Netherlands.....	20,651	19,303	1,038	1,282
Norway.....	9,900	12,261	678	1,290
Portugal.....	5,295	10,438	(1)	(1)
Spain.....	8,801	9,773	2,711	1,875
Sweden.....	7,366	10,491	(1)	(1)
Switzerland.....	1,071	3,745	(1)	(1)
Australia.....	130,395	121,647	12,880	8,476
China.....	11,403	12,020	9,367	13,421
Hong Kong.....	4,550	3,803	3,198	3,975
India and Ceylon.....	177,976	153,041	9,195	1,753
Japan.....	46,683	81,628	50,088	91,648
Kwantung.....	.....	.....	1,281	10,785
New Zealand.....	32,007	23,701	1,399	1,170
Philippine Islands.....	.....	.....	6,815	7,935
Straits Settlements.....	10,333	10,246	(1)	(1)
British E. and W. Africa.....	7,980	24,966	(1)	(1)
British South Africa.....	36,022	40,316	2,280	5,165
Egypt and Palestine.....	9,181	22,126	(1)	(1)
Portuguese East Africa.....	5,182	5,004	(1)	(1)
Argentina.....	39,926	42,975	12,209	18,472
Brazil.....	8,955	6,243	9,552	10,439
Chile.....	4,475	6,584	8,346	8,273
Colombia.....	(2)	(2)	8,471	6,585
Cuba.....	(2)	(2)	27,302	52,855
Dominican Republic.....	(2)	(2)	1,455	2,812
Guatemala.....	(2)	(2)	1,187	1,762
Honduras.....	(2)	(2)	6,691	5,263
Mexico.....	(2)	(2)	18,949	23,268
Panama.....	(2)	(2)	1,522	2,467
Peru.....	(2)	(2)	6,141	6,538
Uruguay.....	(2)	(2)	1,704	2,396
Venezuela.....	(2)	(2)	2,412	2,628
Other S. A. Countries (2).....	6,838	8,793	(1)	(1)
All other countries (1).....	143,860	211,953	12,043	18,120
Total.....	1,039,029	1,176,614	424,250	556,804

(1) All other countries, including non-allocated.

first half of 1923 show that the United Kingdom has exported a tonnage equal to almost 50 per cent of its steel ingot production. French exports were in practically the same ratio for the first five months of the year, with nearly half the tonnage going into Belgium. The data reported for Germany show that, for the first five months, exports of iron and steel more or less balance imports. It is believed that a great deal of the iron and steel produced in Germany in 1922 and the first half of 1923 has gone into improvement and reconstruction of industrial works, including iron and steel plants. If this is the case, Germany will be better prepared to take her place in the steel export field when conditions adjust themselves.

That the iron and steel trade of the United Kingdom for the first half of 1923 was more widely distributed than that of the United States, and more evenly divided

among the hemispherical groups of countries of the world, is shown by the accompanying table. In this period practically five-eighths of the total American export tonnage of iron and steel products went into Canada, Cuba, Mexico and Japan.

It should be noted that the figures for "all other countries" under the United Kingdom include a large

tonnage which has not as yet been allocated. That part not distributed in the first quarter amounts to approximately 114,200 tons and in the second quarter to 158,000 tons. Where detailed figures for various countries are not given under the exports from the United States, it may be understood that the total for the period would be less than one thousand tons.

RECOMMENDATIONS FOR BEARINGS

Report of Special Committee of Association of Iron and Steel Electrical Engineers

BY D. M. PETTY*

DURING the past year the Committee on Bearings has made a careful study of the problem of applying roller and ball bearings to motors. It has held one joint meeting with a committee representing the Power Club and appointed to study the same problem. Among the users of motors is a relatively small class who have used ball or roller bearings in motors. A vast majority of this class are enthusiastic over the results obtained. They have had some bearing failures, but have been able satisfactorily to explain these failures and have definitely fixed the cause. A few of these follow: Improper mounting; improper size of bearing; grounded armatures; improper lubrication. This item may be divided into improper lubricant and lack of sufficient quantity of the proper lubricant.

Among the motor builders are three classes:

1. Those who have used ball bearings extensively. These builders usually report good results and, where a standardized method of mounting has been worked out, do not quote excessively high prices for motors equipped with ball bearings when compared with their prices for sleeve bearing motors.
2. Those who believe that ball or roller bearings can be successfully applied, and are entirely willing to furnish motors equipped with these bearings, provided the motor user will pay the bill. The bill is high because no standardized method of mounting has been worked out.
3. Those who believe that motors are good enough with the present type sleeve bearing, and who furthermore believe that, if bearing improvements are necessary, they can be made in the sleeve bearing. Their arguments against ball bearings include excessive cost of changing existing designs and excessive cost and difficulty of doing the accurate machine work necessary in mounting the ball or roller bearings.

Builders of Bearings

With the builders of bearings the ball bearing has been standardized internationally. This standardization includes three general weights of bearings, light, medium and heavy. Each of these three general classifications includes many varieties. This standardization does not include the size of ball or shape of race, but the outside diameter of the outer race and the inside diameter of the inner race. In other words, the international standards make the mounting dimensions of ball bearings entirely interchangeable from one manufacturer to another. The ball bearing industry is to be congratulated for excellent work along this line.

Roller bearings of the large diameter, short length, solid type have been somewhat standardized along the same line. There is, however, still room for improvement in the standardization of roller bearings. Several lines of roller bearings on the market are interchangeable with the medium series of ball bearings.

Ball or roller bearings properly mounted are good or bad, depending upon the accuracy of the grinding. Great improvements have been made in the past five years along this line. Ball-bearing builders in general have made more progress than roller-bearing builders, but the latter are rapidly catching up, and even now no trouble results from this cause. As the use of ball and

roller bearings is constantly increasing, the manufacturing facilities have been constantly increasing, so that the cost of the finished bearing has been gradually decreasing and this should continue.

Roller bearings of small diameter and great length do not line up with the ball bearings so well as the roller bearing of large diameter and short length. Therefore the standardization of this general type of roller bearing has not advanced to the same extent. Owing to the marked difference between this type of bearing and the ball bearing, it will likely be found necessary to make a separate standardization.

Recommendations of the Joint Meeting of the Bearing Committee and the Electric Power Club

1. It is desirable to standardize bearings as quickly as possible, so that motor users may install roller or ball bearings in existing motors and use sizes which will line up with standards to be used by motor builders in the future.

2. It is considered desirable and practical to standardize on ball-bearing sizes that will be interchangeable with roller-bearing sizes, so far as outside and inside diameters are concerned. Roller bearings in this discussion being limited to the solid roller type, it was pointed out that, while a roller bearing and ball bearing of the same inside and outside dimensions would be interchangeable from a mounting standpoint, the roller bearing would almost invariably be capable of carrying a somewhat heavier load.

3. After a general discussion it was considered advisable to adopt the standard ball-bearing sizes of the 300 series, and that the roller bearings be made to conform to these sizes so far as inside and outside dimensions are concerned.

4. That the number of sizes standardized upon for motors be limited to the smallest practical number, so as to reduce the number of spare bearings necessary to stock for protection against breakdowns.

5. That no attempt be made to standardize on any particular size of bearing for a given frame size of motor of any given horsepower rating or speed; that the selection of the sizes for any line of motor be left in the hands of the designing engineers.

In line with paragraphs 3 and 4, the association committee has set up the following as a tentative list of sizes:

Series	Mounting Dimensions of Race in Inches	
	Inside Diameter	Outside Diameter
304.....	0.7874	2.0473
305.....	0.9843	2.4410
307.....	1.3780	3.1493
309.....	1.7717	3.9370
311.....	2.1654	4.7244
314.....	2.7559	5.9055
317.....	3.3465	7.0866
320.....	3.9370	8.4646
323.....	4.5276	9.8426
329.....	5.7087	12.2047
336.....	7.0866	14.9606

This list of sizes will take care of motors up to approximately 150 hp. The committee desires a full discussion of this selection, not only from the builders of motors, but from the builders of bearings, as well as from the users of motors. It should be pointed out that, while it is desirable to have the number of sizes held down to the irreducible minimum, it would be unwise unduly to penalize certain sizes of motors by compelling the designing engineer to use a bearing much too large. On the other hand it should be pointed out that one of the pitfalls into which motor designers most frequently fall is that of using a bearing too light for the hardest service in which the motor eventually finds itself.

Discussion

Mr. Brown of the Electric Power Club emphasized the strong movement toward cooperation between the Association of Iron and Steel Electrical Engineers and the Electric Power Club in the establishment of stand-

*Electrical superintendent, Bethlehem Steel Co., South Bethlehem, Pa., chairman of the committee. The report was presented at the Buffalo meeting of the association.

ards. The Electric Power Club already has 16 standard horsepower ratings from 1 to 100 hp., involving 13 shaft sizes and various pulley sizes. To meet this stage of standardization the association has arrived at 15 sizes of ball bearings.

Mr. Hipple, in discussing the report, pointed out that the difficulty lies in getting motor manufacturers to redesign their equipment to fit the standards provided by these various standards committees. What the electrical engineers want as a final answer is a line of motors with ball or roller bearings already in them. Due to the variation in specific dimensions in the product of various motor manufacturers, it does not appear feasible to limit to 12 or 15 sizes of bearings the standards for both general purpose and mill type motors. As a matter of fact, the speaker pointed out, both ball and roller bearings are experimental as yet and it might be well to go slowly in establishing standards on something which is still feeling its way, especially as some of these standards so established might turn out to be something which is not wanted. Sleeve bearings of the oil ring type can now be had which require oiling not oftener than every three months.

H. E. Brunner, chief engineer S. K. F. Co., showed on slides the great diversity of present designs of motors made by different manufacturers. In some cases dimensions varied by more than 50 per cent for motors of the same power, and each size of motor had a wide variation in almost every particular concerned with the bearing question.

D. M. Petty, in his closure, stated that no standardization along this line is possible unless all of the motor manufacturers make some sacrifice on some of their sizes. This sacrifice, however, will be one in name only, because the manufacturer in any event will charge his customer with whatever it costs to make the change. There is no difficulty in this connection in new motors, because it is just as easy to adhere to the standards established in making new patterns from

new drawings as to follow any other dimension and, as motors are being changed in particulars of design every few years, it ought to be only a short time before complete new lines are out. The standards could thus be put into effect within such period and with very little trouble.

Bearings for general purpose motors and for mill motors could just as well be the same thing, with the provision that for a mill motor the next larger size bearing would be used, because this motor is more rugged and a little heavier. The increase in cost of frictionless roller bearings would be compensated for by their increased life. Short and approximately square rollers are to be preferred to long rollers, principally because precision in the latter case is very difficult to obtain.

E. S. Jefferies pointed out that motors with anti-friction bearings require only a small fraction of the time of maintenance men called for by motors with the sleeve or other type bearings. As a case in point, he mentioned that babbitt bearings have a life usually, between repairs, of 500 to 600 hr. of running, whereas a roller anti-friction bearing, substituted for the babbitt bearing, has been running for more than a year without special attention and is still going strong. As regards bearings in general, 50 per cent of the trouble is reported as due to oil and grease getting out of the bearing and into the motor windings.

Another speaker pointed out that when grounds occur in d.c. motors, the flow of current seems to affect ball bearings badly, wearing spots at the points of contact and making it necessary to replace the bearings. In the case of a grounded armature, the cost of thus replacing the bearing is reported as greater than that of repairing the armature. Consequently, a short circuit brush has been developed for carrying the current past the bearing. From the standpoint of keeping oil and grease out of the motor, ball bearings were reported far superior to sleeve bearings.

SALE OF NAVAL VESSELS

Estimates of Tonnage of Metal to Be Scrapped Are Announced

WASHINGTON, Oct. 2.—Preliminary estimates have been announced by Capt. E. W. Bonnaffon, officer in charge in the sale of naval vessels, of the approximate tonnages of metal in ships that are to be scrapped under the four-party treaty for limitation of armaments. The estimates take into account the approximate tonnages in the vessels on the ways and the approximate averages of materials in vessels afloat. The figures were compiled at the request of prospective bidders. The latter are advised, however, to inspect the vessels and make their own estimates. As Captain Bonnaffon states, the figures given are merely approximate, are not guaranteed and may be changed by later surveys. The navy will withhold certain tonnages of armor and special treatment plates, as well as certain non-ferrous materials on ships and in yards and in the case of some vessels only a small fractional part of the tonnage they contain has been included in the estimates. The result is that the total indicated by these tentative figures is brought down greatly under an original estimate of 321,970 tons of ferrous and 11,000 tons of non-ferrous metal. The estimated total under the program as now devised includes 199,677 tons of steel and 5623 tons of non-ferrous metal.

The program calls for the scrapping of 21 vessels. They are to be sold by sealed proposals on Oct. 25, Nov. 1, Nov. 8 and Nov. 30. The battleships and battle cruisers on the ways at navy yards which are to be sold on Oct. 25 were made available for inspection yesterday. The battleships include the South Dakota at the New York Navy Yard; Montana at the Mare Island, Cal., Navy Yard, and the North Carolina at the Norfolk, Va., Navy Yard. The battle cruisers are the Constitution and the United States at the Philadelphia Navy Yard.

The ferrous metal on the South Dakota is estimated

at 8656 tons, while the approximate tonnages not on the ways are 1652 tons, armor 511 tons and non-ferrous metals 23 tons; on the Indiana, 7665 tons of ferrous metal and 1833 tons not on the ways; armor 259 tons, non-ferrous 19 tons; Montana, ferrous metals, 5580 tons, structural material fabricated but not erected, 900 tons, non-ferrous 7.5 tons; North Carolina, ferrous metals 8580 tons, steel fabricated but not erected, 1348 tons; Constitution, steel erected in ship, 3340 tons, steel not erected, 3500 tons; United States, steel erected in ship, 2410 tons, steel not erected, 4000 tons.

The old capital ships involved in the scrapping total 11, with an average weight of 13,830 tons. The battleships afloat to be sold Nov. 1 include the New Hampshire and Louisiana at the Philadelphia Navy Yard, the Georgia and Rhode Island at Mare Island and the Connecticut at Puget Sound, Wash., Navy Yard. These will be available for inspection Oct. 15. Battleships afloat which are to be sold Nov. 30 will be open for inspection Nov. 19. These are the Michigan, Minnesota and Kansas at Philadelphia, Vermont and Nebraska at Mare Island and Delaware at Boston, Mass.

Ships under construction to be sold Nov. 8 include the battleship Iowa and battle cruisers Constellation and Ranger at the plants of the Newport News Shipbuilding & Drydock Co., Newport News, Va., and the battleship Massachusetts at the plant of the Bethlehem Shipbuilding Corporation at Fore River, Mass. These vessels will be open for inspection on Oct. 15. The approximate tonnages to be scrapped as given by preliminary estimates show that even allowing for the fact that these vessels are only partially completed, a great deal of tonnage is to be withheld. The total quantity estimated for the Constellation is 8211 tons, while for the Ranger it is only 25 tons.

For the Iowa the total is 10,962 tons, of which 1526 tons is fabricated and partly fabricated plates and shapes. This vessel is 29 per cent completed, so that the estimate is taken to include all of the steel in this ship. On the other hand, the estimate for the Massachusetts is only 2119 tons.

X-Rays in the Steel Industry—II

Advantages of the New Method Using an Absorbing Liquid —Studying the Properties of Special Steels— Future Outlook

BY DR. ANCEL ST. JOHN*

IN using X-rays in this way it is necessary to protect the operators from the rays and to prevent stray secondary radiation from fogging the films. This may be done by working in a lead walled room or by placing the X-ray tube in a lead covered box, allowing the rays to pass through convenient openings to the objects undergoing examination and screening them off with lead beyond the object. In either case if the object does not extend beyond the edges of the film, or if it is much thinner in some parts than in others it is necessary to provide auxiliary absorbers to make the illumination over the entire film of the same order of magnitude. Otherwise the effect will be much like

light areas, the brass as dark areas, in the background due to the absorbing liquid.

The illustrations have been reduced in size and much of the finer detail has been lost in reproduction but a sort of spongy structure in the cast fragments at the bottom of Fig. 9 and a light line lengthwise of the third bolt from the right are plainly visible. This line is due to a slag filament and the fact that it is not distorted in the head shows that the bolt was cut from bar and not cold-headed. This method has been used for objects as large as $4\frac{1}{2}$ in. diameter and 1 inch thick with complete success. Where the object is too bulky for immersion it is necessary to

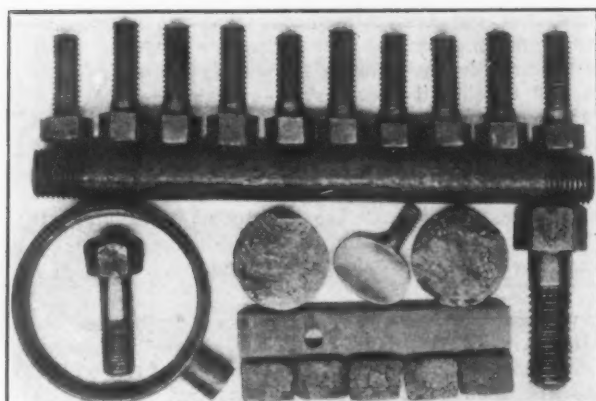


Fig. 6.—Group of Irregular Objects to Be Photographed

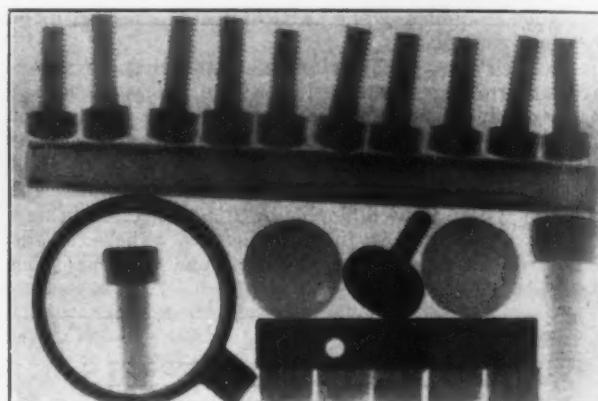


Fig. 8.—Radiograph Made by Author's Method

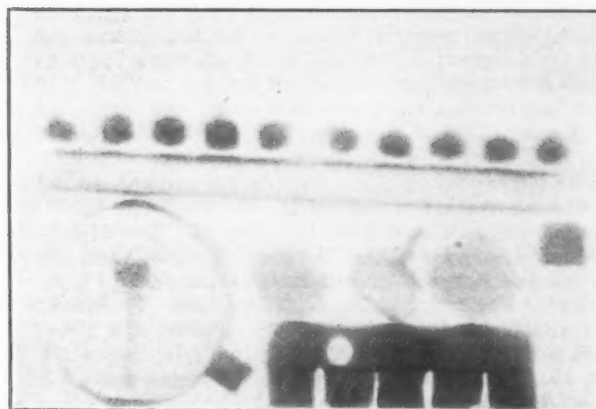


Fig. 7.—Radiograph When Transparency to X-Ray of All Parts Is Not of Same Order of Magnitude

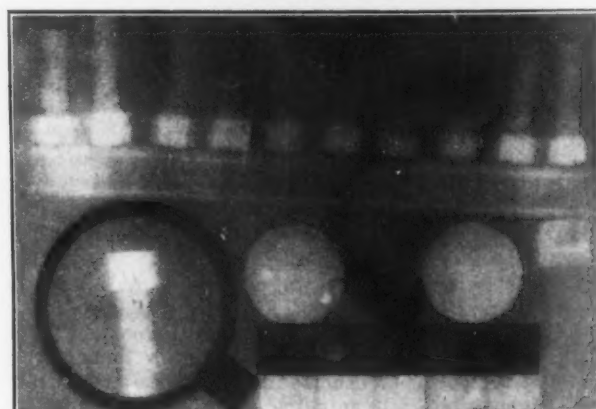


Fig. 9.—Radiograph When Absorbing Power of Medium Is Greater Than That of Specimen

trying to photograph a room with the camera facing a brightly lighted window.

To overcome this difficulty the author has developed a method² of immersing the object in a liquid of suitable absorbing power, in a container with parallel transparent faces. Figs. 6, 7, 8 and 9 illustrate the method. Fig. 6 is a photograph of a miscellaneous collection of articles to be examined simultaneously; Fig. 7 is a radiograph taken without any precautions against the "glare." In Fig. 8 the objects were immersed in a liquid of somewhat less absorbing power than steel and in Fig. 9 they were in a liquid of absorbing power greater than steel but less than brass. In this picture the steel objects appear as

use a plastic medium impregnated with an absorber. Dr. Lester, in an unpublished communication, reports using wax impregnated with lead salts and bismuth.

The advantages of X-ray examination are great. A few exposures, oftentimes a single exposure, will give more information than many sectionings. The nature, extent and location of all defects more than one-fiftieth of the thickness will be disclosed without harming the object in the least. If sections for macroscopic or microscopic study are desired, they can be made so as to be certain of displaying the particular defects to be investigated. Nor need X-ray examination be restricted to the research or development laboratory. In the shop, routine X-ray inspection of all material before beginning manufacture may in many cases be a profitable procedure. This will be particularly true if the subsequent labor costs are high

*Union Carbide & Carbon Research Laboratories, Inc., Long Island City, N. Y. The first instalment was published in THE IRON AGE, Sept. 27.

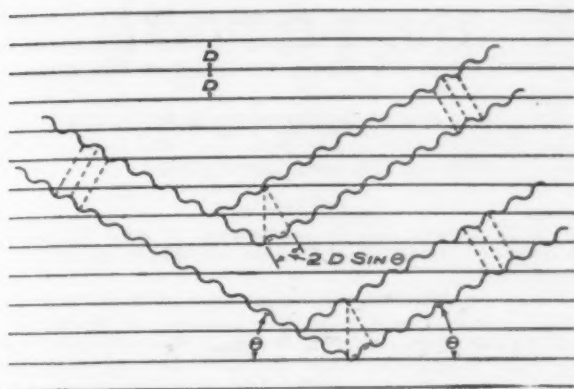


Fig. 10.—Reflection of X-Rays by a Crystal

and the losses by rejections due to disclosure of hidden defects in a late stage of manufacture, are at all great. For X-ray inspection spots the hidden defects before any work is done.

Studying the Properties of Special Steels.

The method used in studying the properties of steels depends upon the diffraction of X-rays by crystals. The theory of the method and examples of its use in determining the crystal structure of several elements have been given by Dr. A. W. Hull^{5,6} and a convenient apparatus has been described by Dr.

and a filter is arranged to suppress all but one wavelength in the radiation from the tube as shown in Fig. 11, taken from the article by Dr. Davey⁷. Each set of parallel planes that exists in the atomic arrangement characteristic of the crystal will be represented on the film by a line at the correct angle from the undeviated beam provided there are enough crystals placed at the proper angle. If the crystal grains are very small, i.e. less than 0.0001 in. in diameter the chances are that there will be many grains at every possible angle, so that every spacing will be represented. On account of the small size of the grains the lines on the film will be smooth and continuous. If the grains are exceedingly small, approaching molecular dimensions the lines will be broad, diffuse bands, while if the grains are at all large, i.e. exceeding 0.001 in. in diameter the lines begin to be speckled. As the grain size increases the speckles become larger and decrease in number until sometimes the lined appearance disappears. Some of these effects are illustrated in Fig. 12, which shows fine grained and coarse grained nickel, and medium grained tungsten. The difference between the face-centered cubic pattern of nickel and the body centered cubic pattern of tungsten is also shown.

The extension of the method to the field of alloys, including steel, has been discussed by Bain in a series of papers^{8,9,10}. A striking example of the ability of the method to go beyond the realm of the metallurgical microscope is given in the second of these papers⁸. A

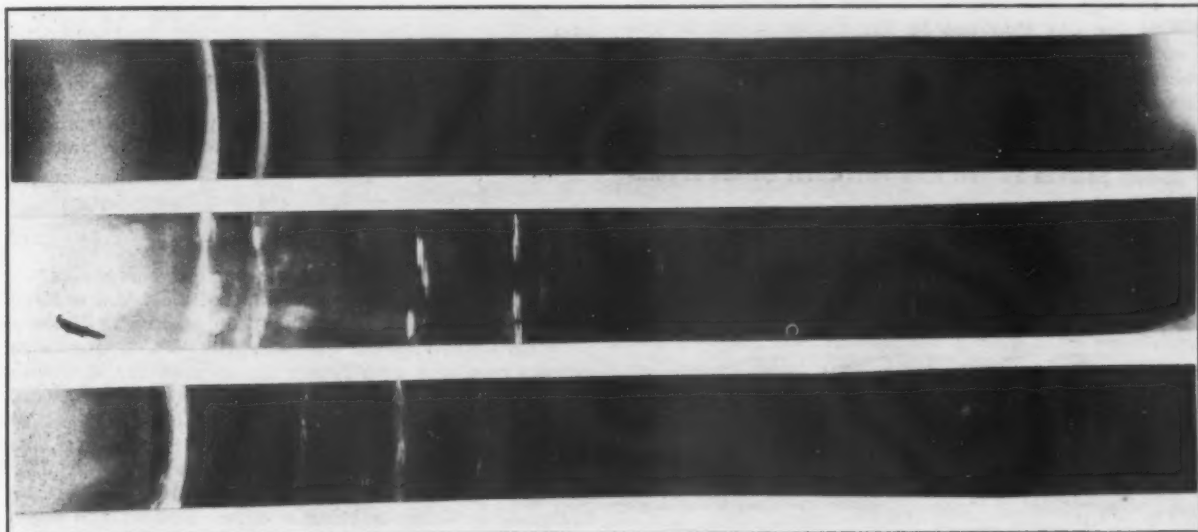


Fig. 12.—Crystallograms of Nickel and Tungsten

Davey⁷. It is well to recall the principal features of the method. If the atoms in a substance are arranged at random the scattered X-rays referred to in a previous paragraph will be scattered at random. But if the atoms are arranged in an orderly manner, as they are in crystal grains, marked increase in the scattering, in fact, a definite reflection of the rays, may occur under suitable conditions. It is well known that two trains of light waves proceeding from a common source to a point of observation nullify each other if they arrive out of phase and reinforce each other if they arrive in phase. They will arrive in phase only if the two paths are equal or differ by a whole number of wave-lengths. Accordingly a train of X-rays having a wave-length λ , incident θ on a series of atom planes a distance d apart will be reflected provided they satisfy the equation

$$n\lambda = 2d \sin \theta$$

where n is a whole number, known as the order of the reflection. This is illustrated in Fig. 10, taken from an article by Bain⁶. The value of λ is known, being characteristic of the material composing the target. The angle θ is half the angle between the undeviated and the reflected beams and can be measured, hence the value of d can be calculated. In practice a film is bent to form a part of a cylindrical surface with the specimen on the axis, as indicated in Fig. 11. Screens and slits are provided to prevent fogging of the film by rays scattered from other things than the specimen,

sample of apparently coarse grained austenitic steel prepared and photographed in the early summer of 1920, and thereafter kept at room temperature was placed in the X-ray crystallometer in the fall of 1921 and found to give a pattern identical with pure, fine grained ferrite, that is, body-centered cubic, instead of the coarse grained face-centered cubic structure of



Fig. 11 —X-Ray Crystallometer

austenite which was expected. A new photograph of the surface showed no great difference in the visible structure of the grains. During the fifteen months at room temperature the austenite had spontaneously transformed into martensite, each of the original grains decomposing into a great many crystal fragments without altering the original grain boundaries.

A further illustration of the ability of the X-ray method to disclose information not otherwise obtainable is given by the investigations of Westgren and Phragmen on the crystal structure of iron at high temperatures¹⁰. They used a crystallometer in which the sample was a fine wire which could be heated electrically, and showed that the body-centered cubic pattern of alpha iron persists through the region usually assigned to beta iron but disappears when the gamma iron region is reached and is replaced by a face-centered cubic structure. At a temperature slightly lower than the melting point the body-centered form again appears for delta iron.

The Future Outlook

The few cases here described and the many examples given in the references cited show how X-rays are already being used to help in making better steel products and to increase our understanding of the structure and properties of steel. These fields are broad; the new tools are already powerful and are constantly being improved; the ground has thus far only been scratched. X-ray inspection of moderate sized castings and forgings is now a commercial possibility; the day may not be far distant when it will be common practice. X-ray analysis of the crystal structure of steel is at present confined to the research laboratory; it is not unreasonable to believe that the day is coming when it will be found in the control laboratory, and specifications for steel will call for a particular X-ray pattern as well as a particular chemical com-

position. It is well for the makers, the treaters and the users of steel to be thinking of these things and to be preparing to use X-rays profitably in the steel industry.

The author desires to express his indebtedness to the Watertown Arsenal, to Mr. E. C. Bain and to Dr. W. P. Davey for the use of certain illustrations.

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ORDERS FROM JAPAN

Conditions in Canada Improved by Buying for Rebuilding—Rail Mill Idle

TORONTO, ONT., Oct. 2.—The Canadian iron and steel market, which has been without feature for the past couple of months, is beginning to show more life. While the demand for steel for home consumption is steadily improving, it is also pointed out that Canadian mills have recently closed large contracts for orders for steel for shipment abroad and at the same time inquiries have been received for still further large tonnages on export account. According to George Spence, sales manager Steel Co. of Canada, Hamilton, Ont., his company has received large orders for bars, rods and nails from Japan, the material to be used for reconstruction purposes. At the same time it is pointed out that inquiries have also reached Canadian firms for galvanized sheets and figuring on this business is under way. The British Empire Steel Corporation, Sydney, N. S., has also received extensive orders from Japan, this company having closed contracts for large bars of sufficient tonnage to keep its bar mill in operation for several weeks. At the present time both the Steel Co. of Canada and the British Empire Steel Corporation are busy on new business and the latter company is contemplating blowing in a fourth furnace in order to take care of its pig iron requirements which have considerably improved during the past few weeks. The company has three blast furnaces blowing. Curtailed production is reported by the Algoma Steel Corporation, Sault Ste. Marie, Ont. This company has closed down its rail mill, having completed large rail orders for the Canadian National and Canadian Pacific Railways, and while officials of the company are trying to secure new orders, there is nothing at present in sight.

Canadian steel plants are finding a stronger demand for practically all commodities and while material is available for almost spot delivery in most lines, orders are coming to hand in good volume and it

is the opinion of officers of the various companies concerned that the demand for iron and steel will continue up to the end of the present year at least. Building activities have been exceptionally brisk for some months past and as a result the demand for structural steel has been heavy. During the past two or three weeks Canadian producers have been closing orders for large tonnages of shapes, beams, reinforcing bars, etc., for spot delivery, this material being required for building which will be rushed to completion before unfavorable building weather sets in. Shapes and beams are quoted at 2.70c., Toronto. The demand for iron and steel bars is showing some improvement, but consumers and dealers are showing a preference to buy only sufficient material to keep them going for a short time. Mills are quoting bars at 3.10c., Toronto. Some good business has recently been closed from companies with car and repair orders on their books for plates, and while a large volume of the orders for plates is going to United States producers, Canadian producers are also actively engaged. Plates are quoted at 2.60c., Toronto.

While the demand for sheets has been fairly quiet of late, mill representatives are expecting to close a good share of the demand for galvanized sheets for which inquiries have recently been received from Japan. Black and blue annealed sheets are moving slowly at present, but the general undercurrent in the market leaves the impression that a stronger demand is not far in the future. Galvanized sheets have been in good demand and builders and dealers have been buying in good volume, both for immediate use and for stock purposes. Mill prices on sheets are firm and as follows: No. 28 gage galvanized, 6c.; No. 28 gage, black, 4.60c.; No. 10 gage, blue annealed, 3.70c., Toronto.

The Hunter Crucible Steel Co., Cleveland, has installed a new 30-pot crucible furnace, the first heat from which was poured Sept. 27. This furnace will be used principally in the manufacture of high speed tool steel.

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The Wealth of "the Rich"

THAT 2 per cent of the people of the United States own 65 per cent of the wealth has been commonly asserted as an argument for the so-called radical legislative program. At bottom the proposals of the various blocs that are expected to be active at Washington in the coming year represent a purpose to secure a redistribution of income or property or both. The situation gives particular timeliness to the article published elsewhere in this issue on "The Distribution of Wealth in the United States." It well may be described as an economic contribution of major importance. Dr. Walter Renton Ingalls, as an engineer and economist and the author of "Wealth and Income of the American People," is competent to speak respecting this phase of quantitative economics, to which he has devoted prolonged study.

Even if the Western agrarian program of "Soak the rich" be not consummated, even if there be nothing more than partial concessions to it, there will be important and far-reaching effects upon the welfare of our country.

Dr. Ingalls, avoiding all spirit of captiousness, finds no fault with the agrarian Senators for entertaining the belief they hold as to the concentration of the country's wealth, pointing out that they have authority for it in a heretofore uncontroverted statement in a report to Congress by a commission of its creation. He shows positively, however, that this assertion was not based upon direct studies of the commission or its staff, but was merely a citation from a single economist; an economist of excellent standing, to be sure, but one who was making merely a reconnaissance, so to speak, at a time when available data in this field were very scarce.

Dr. Ingalls then proceeds, with calm logic and the practicality of the engineering mind, to make a new reconnaissance in the light of the data that recently have become available. He is not dogmatic and makes no attempt to pronounce a specific figure as the answer to a problem that is inherently too complicated and uncertain so to be answered. He merely indicates limits between which the answer is probably to be found. His

frankness in marking as conjectural his assumptions, as distinct from his facts, renders his deductions all the more impressive. They constitute a powerful refutation of the dangerous fallacy that is now influencing the minds of many of our people.

Improved Yield in Pig Iron

ANOTHER year has been added to the statistical record of increasing yield of pig iron from the ferrous material charged to blast furnaces. The annual statistical report of the American Iron and Steel Institute, just issued, shows that in 1922 for each ton of pig iron produced the ore, scale, scrap, etc., charged to blast furnaces was 1.920 gross tons, against 1.925 tons in 1921. A gain so small might be attributed to the fact that there was a decrease in the ore charged and an increase in the scrap, the latter being richer in iron. But, on the other hand, only the fittest furnaces were running in 1921, while less fit furnaces operated in 1922, the increase in production from 1921 to 1922 being 62 per cent.

Statistics of the consumption of ferrous materials in blast furnaces began with the year 1909. There was an increase in the amount per ton to 1911, that year showing 2.018 tons, made up of 1.859 tons of ore, briquettes, etc., and 0.159 ton of scrap, cinder, scale, etc. Since then there has been a continuous decrease, except for a slight backset in 1917 and 1918, when various things went amiss.

It is generally agreed that the average iron content of the ores shipped from the Lake Superior region decreases year by year. To an extent this may be offset by our importing more ore, generally rich ore, and perhaps using less native low grade ore from certain districts. At any rate we are not making more pig iron in proportion to ore consumed on account of the ores becoming richer. The gain is due to improvement in blast furnace practice.

There has been reference lately to furnace managers being able to retrieve more of the iron in scrap charged than used to be possible. It might be thought that as time passes we should use more scrap and less ore in making pig iron.

but the statistics do not bear out any such idea. In 1911, a year of light pig iron production, there was 0.159 ton of scrap, scale and cinder, while in 1912, a year of heavy production, there was 0.145 ton. Of the last two years, 1921 was one of light production, with 0.141 ton used, while 1922 was one of much heavier production, with 0.154 ton used. The figures do not show that large or small total outputs have anything to do with the material used. The proportion of ore has simply decreased somewhat.

Naturally the consumption of fuel has likewise decreased. The statistics of fuel consumption begin with 1912, when coke consumption per ton of pig iron was 2436.5 lb., the greatest shown. In 1921 it was 2200.6 lb. and in 1922 2176.3 lb. The limestone consumption in 1922 was also the lowest within the statistical period, being 969.3 lb.

Transportation being an important part of the cost of making a ton of pig iron, the iron industry of the United States is improving its economic position in an important respect. The improvement in practice suggested by the statistics is not general as yet, hence further progress is naturally to be counted upon.

Relative Values of the Dollar

FOR several months after the war there was much complaint about the low purchasing power of the dollar and there were heated arguments as to whether or not we were going to return to pre-war price levels. Nearly all the opinions expressed fell under one of two heads: (1) That all prices would have to get back to their old levels; (2) That the value of the dollar itself was greatly lowered, hence that one should expect all prices to remain correspondingly higher.

Nearly five years later it is well worth while to revert to these opinions and see what really has occurred. By such reviews a suggestion is frequently furnished as to what weight we should attach to new opinions on economic matters as they come out.

The composite value of the dollar is indicated by the Bureau of Labor's commodity index number, the weighting of which is according to volume of production in the different groups of commodities. The basis is the average of prices in 1913, taken as 100. For December, 1918, the month after the Armistice, the number stood at 202. The average or composite value of the 1913 dollar had been cut in half. By February, 1919, the number was down to 193, but there it turned, rising to 247 in May, 1920. Thus the dollar was not deflated; it was inflated more. The index number then declined to 138 in January, 1922, which is as far down as it has ever gone. For August of this year it stood at 150.

Thus the first great movement in prices was a rise instead of a decline, and nearly five years after the Armistice the dollar is worth on an average two-thirds as much as in 1913.

If the fault lay with the dollar, however, we should now expect prices of different commodities all to stand at about 50 per cent above their 1913 level. That is far from being the case. Why talk of the dollar as having some precise value, when

its value varies greatly according to the commodity for which it is exchanged?

The claim that commodity prices must needs get back to pre-war levels is settled. The thing has not occurred. Next one may inquire whether it is the low value of the dollar that makes prices high. If it is, all prices should be equally high, within reasonable limits. Particular commodities that were out of line, at the end of the war, through being above or below the general average, should have trended toward that line. This also has not occurred. A simple comparison can be made by taking the report for February, 1919, at the bottom of the little dip that occurred after the Armistice, when the index number for all commodities stood at 193, and scaling each group of commodities down in the proportion of 193 to 150, the number for August. It is then seen that farm products would have been at 168, or well above the general level, while in August they stood at 139, or well below the average. Why did they not stop at the general level, if it is a matter of the value of the dollar? On the other side, building materials would have been at 135

February, 1919, while they are now at 186. They were relatively too low, now they are relatively too high. Almost precisely the same showing is made by housefurnishing goods. Another case entirely is that of cloths and clothing, which were above the general average just after the war, but are now much farther above.

These comparisons show that the various commodities have simply been making their markets according to circumstances. They ignore entirely the value of the dollar and are concerned only with their own values.

Workers' Thrift Increases

RECENT experience of the mutual savings banks, cooperative banks and other institutions where industrial employees place their savings indicates that the American workman is showing more intelligent and consistent thrift than at any time in recent years, according to the analysis of accounts by bank officials. The nation's total savings accounts have increased greatly since manufacturing activities again became normal, and, at any rate in the industrial centers, are larger than ever before. The greater part of this growth is attributed to regular deposits from the pay envelopes.

The hard times of 1920-21 taught a lesson in thrift. Coming suddenly, after a relatively long period of extravagantly high earnings, they caught countless families ill-prepared. Prodiggally high incomes had brought with them an orgy of spending. Under the feverish influences of wartime and the period immediately following, men and women workers got the idea deep planted in their minds that the new era was a permanent condition. It is true many of them saved their money in one form or another, in proportion to their earnings, but a vast number did not. The rainy day seemed far away. And then came the deluge of unemployment.

Savings deposits had to be drawn upon. The banks found withdrawals large and constantly

increasing, and at the same time new deposits fell away, of course. Many workers exhausted the last cent of their savings. It was a hard lesson, but one, however, which was taken to heart by the many who dropped the new standard of living and settled down to get on their feet again. The result is seen in the big totals of deposits on the books of the banks.

Another and a very important influence on the new thrift is the sympathetic activity of employers to encourage systematic saving, particularly to induce wage earners to lay aside something each week from their pay envelopes. Various plans have been adopted, and each has done something toward bringing about the desired result. And in this connection emphasis should be laid on the work done by owners in discouraging the placing of savings in speculative investments. The average industrial employee is easy prey for the professional salesman of the class which peddles spurious oil stocks and similar "securities," with their promise of quick riches.

Employers have found that the only really effective way to combat this influence is to go for the root of the evil, the stock salesman himself, or herself, as sometimes it is. Some of the chambers of commerce and other civic organizations have assisted in this protective work. They maintain investigating bureaus, to which the arrival of a new salesman or a new prospectus is reported as soon as known. Reputable brokers and the bank men lend every assistance. If there is evidence of fraud or of violation of "blue sky laws," where they exist, then the police are called in. In recent months many a stock salesman who has been soliciting workmen has flitted away in the night to some new scene of activities. Unfortunately there are still many communities where interest in this sort of welfare work has not been aroused.

However, the interest in encouraging thrift is without question responsible to a large extent for the showing of the savings banks. As a phase of management it is still in its infancy, but the promise is that the effects will be rapidly cumulative.

Inefficient Indexing

VIGOROUS protest is made by *Engineering*, London, because scientific and technical books are poorly indexed. It is complained that users of such works are often seriously handicapped in their research because the contents cannot easily be found; that due to inadequate indexing laborious search is necessary in order to get at desired information.

American publications have improved greatly in this respect in recent years, yet some of them still suffer from the old complaint. Authors may take too much for granted as to the intimacy of their readers' knowledge of the subject at hand. Or, as librarians point out, the work may be done in an amateurish manner, instead of by the clean-cut method of the professional, for indexing has

come to be a vocation in itself. Or the selection of the indexer may not be carefully considered and he may lack the knowledge of the subject requisite to skilful work. The tendency is to under-index, which is always a mistake. Users of books rarely complain that the subject matter is over-indexed. As a rule American students and investigators are quite well looked out for, the *Engineering Index*, which classifies all articles published by the technical and engineering press, adequately meeting the needs in those fields.

Engineering, in pursuing the subject, says:

For some reason, scientific and technical books have had to put up with indexes that do far less than justice to their contents. This may be no great hardship where the book is slender or is of little worth, but the better the book, and still more, the more complex and voluminous its information, the better its index must be if it is to enable the book to be used to proper advantage. To compendiums of practice good indexes have always been desirable, and it is not too much to say that the absence of such indexes to books of their present ponderous girth reduces their value to the reader to an extent that may offset the merit of the increased information that is buried within them. No one is likely to covet the labor and risk of producing yet another compendium unless some very strong inducement is offered, especially when regard is had to the excellent quality of much that is contained in the present works. But if users of such books had the choice of one that gave less information, but in a form conveniently and readily accessible, they would be likely to prefer it to the imperfectly dissected haggis into which compendiums seem to have grown.

Some of the editors of the handbooks issued by American manufacturers may find a hint in the following extract from the same editorial, for not all of the trade matter is indexed to the point of giving the greatest possible assistance to readers:

There are a number of manufactured objects that are applied in several or many branches of engineering, and crop up in a variety of contexts in different parts of the book. Take such a subject as pipes. Even in an ascetic compendium which contains no mention of tobacco there may be easily over a hundred separate references in the index to the various kinds and properties of pipes, and even these are likely as not to omit something important for the reader's purpose which yet may be modestly concealed in some other part of the book. One page may give the thickness of hydraulic pipe, and another the thickness of iron, water and hydraulic pipes, two references may point to the speed of the water through pipes, half a dozen to its flow, and perhaps seven to its velocity; and what these references may be and whether they are the same or different can be discovered only by turning up the several pages quoted, perhaps hundreds or thousands of pages apart. No hint may perhaps be given under the heading of specifications to indicate that the book contains, as it may, several important standard specifications for pipes. If, in fact, you want to know what information is waiting and ready for you, you have to hunt through a mass of entries, sometimes superfluous, sometimes insufficient, and as often as not you may spend many times as much energy in the search as is required in extracting the information when once it is located.

Distribution of Wealth in the United States

(Continued from page 883)

would be relatively insignificant in the aggregate. On the other hand, it is positive that there are duplications in the above summary. For example, some of the assets of life insurance companies are invested in Government bonds and some of the loans of national banks are employed for carrying such securities. Moreover, a considerable proportion of the life insurance assets are invested in railroad bonds and stocks. Bearing these conditions in mind, and making due reservations respecting uncertainties, it appears probable that about 20 to 25 per cent of the wealth of the country is mortgaged internally, in one way or another.

One-Third Our Wealth in Farms

As has been previously shown, the mortgagees are in the last analysis great in number; wherefore there is implied a diffuse distribution of these claims. We may come positively to another conclusion. About one-third of the national wealth is in farm capital. Nearly one-half of the American urban homes are occupied by their owners. Combining these thoughts with the wide distribution of savings bank accounts, life insurance policies, Government bonds, and the stocks and bonds of corporations, it is indisputable that the American people are preponderatingly property owners.

Diffused Ownership of Industrial Property

Even the property of the railroads and industrial corporations is widely distributed through stock ownership. Thus, at the end of 1922 the Pennsylvania Railroad had 140,000 stockholders and 90,000 bondholders, whose combined number was almost equal to the employees of that company, who aggregated about 243,000. So it is with many of the great industrial companies, such as the United States Steel Corporation, the General Electric Co., the General Motors Co., the public service corporations like American Telephone & Telegraph Co., and so on. There is some evidence respecting the ownership of corporate securities in the aggregate, in that the dividends reported by income taxpayers fall short of the estimates of dividends paid by corporations. The latter statistics are not fully reliable. I should hesitate to characterize them as being any more than roughly indicative. With due allowance for these uncertainties we may be viewed as generous in assuming that about 75 per cent of the industrial property of the United States was owned by the income taxpayers of 1916.³

What "the Rich" Own

By making some bold assumptions we may now proceed to estimate the total holdings of the class that I have arbitrarily defined as "the rich." I shall assume that they owned 75 per cent of the industrial property, 75 per cent of the stocks of goods, rather more than that proportion of the gold and silver; that they owned all of the foreign credits other than national; that they

owned automobiles, furniture, clothing, etc., to the average value of \$5,000 each; that they owned all of the urban houses that are rented, all of the other urban real estate, all of the State, county and municipal bonds, all of the mortgages on houses and farms, and one-half of the Government bonds, less only what is attributable to the savings banks and life insurance companies. We may then summarize as follows:

Industrial property, 75 per cent thereof.....	43.0
Stocks of goods, 75 per cent thereof.....	14.3
Foreign investments and credits.....	6.8
Furniture, automobiles, etc.....	2.2
Urban houses, 55 per cent thereof.....	31.7
Other urban real estate.....	24.7
Gold and silver.....	3.0
Mortgages on urban real estate.....	6.7
Mortgages on farms.....	8.0
Government bonds.....	11.5
State and municipal bonds.....	8.0
Gross total.....	159.9
Assets of savings banks and life insurance companies.....	25.3
Net total.....	134.6
$134.6 \div 290.6 = 46 \text{ per cent.}$	

Forty-Six Per Cent Is Maximum for "the Rich"

It is certain that the rich 2 per cent of the people do not own all of the stocks and bonds of industrial enterprises and it is highly improbable that they owned all of the rented urban real estate or all of the shops, hotels and other commercial buildings. But even if they did so, their ownership of the national wealth at the end of 1920 would be not more than 46 per cent. This analysis indicates that figure as the maximum limit of possibility without, however, giving us any positive evidence as to what the percentage really is.

Too much emphasis cannot be put upon this being the maximum limit of possibility. Instead of "the rich" owning all of certain classes of real estate, to the aggregate value of 56.4 billion dollars, it will subsequently appear that their receipts from rentals capitalize at only about 6½ billion. It will appear, moreover, that instead of 43 billion in industrial property the dividends received by them capitalize at only about 35½ billion dollars.

What Income Taxes Show

Fortunately we may approach this subject in quite a different way and one that is more positive. In 1916 there were 437,000 income taxpayers, among whom the number of farmers was negligible. The year 1916 was not one of extraordinary abnormality in the light of what we subsequently witnessed, the general index number of that year being only about 125. Assuming that the 437,000 income taxpayers were all heads of families and that their average family comprised four persons we shall account for 1,748,000 people out of a total population which is estimated at 101,722,000 for the middle of 1916. In other words the income taxpayers represented 1.7 per cent of the total population on the assumption that they were all heads of families, which of course is the maximum that can be assumed.

These taxpayers reported among other things their income from rents, interest and dividends. We may reckon that gross rentals averaged 10 per cent of the value of the property from which derived. We may reasonably conjecture that interest averaged 5 per cent on the principal and that dividends averaged 6 per cent. The interest average may have been a little lower than the assumption while the dividend average may have been a little higher, but although this is all conjectural the fact cannot be at any great variation and would not materially modify the broad result. We may then capitalize the reported incomes as follows:

Rents.....	\$ 643,802,657 ÷ 0.10 = \$ 6,438,026,570
Interest....	1,080,879,405 ÷ 0.05 = 21,617,588,100
Dividends..	2,136,468,625 ÷ 0.06 = 35,607,810,417
Total.....	\$63,663,425,087

³ In 1916 the dividends reported by the Bureau of Internal Revenue as having been received by income tax payers amounted to \$2,136,469,000. The total of dividends paid by corporations was estimated at \$3,783,900,000 by Dr. Friday and at \$3,389,000,000 by Dr. Knauth. The dividends received by income tax payers were therefore 56.46 per cent of the total estimated by Dr. Friday and 63.04 per cent of the total estimated by Dr. Knauth. This would of course imply ownership of dividend paying stocks in like proportion. I have expressed the opinion elsewhere that Dr. Friday's estimate was too high, but in the light of later consideration I think that may not be so. The comparison in this paper between the amount of dividends received by income tax payers and the valuation of industrial property is rather indicative of the contrary. Anyway, these considerations lead me to think that my conjectural estimate of not more than 75 per cent of the industrial property of the United States being owned by the income tax payers of 1916 is reasonably conservative. Inasmuch as the ownership of the stocks of goods is of similar nature the same percentage is roughly assumed for that item. There is no foundation for the guess that this class owns only half of the Government bonds other than the data of the Treasury Department showing a wide distribution thereof.

The remainder of the personal income in 1916 was derived from salaries and business. Respecting salaries there is of course no question in interpretation. Business income, reported at \$3,010,404,924, is a combination of the products of personal service and capital employed in the business. We have no means for making any separation between these two elements. There are included in this the earnings of professional men, of traders and of merchants conducting unincorporated business. No guess for the amount of capital in use in this way would be justifiable, and we can do nothing but disregard this matter, simply making a mental reservation respecting it. We must also make mental reservation respecting income that was not reported.

Two Per Cent May Have 30 Per Cent of Wealth

It appears from the foregoing that the 437,000 income tax payers of 1916, representing 1.7 per cent of the population at the maximum, derived income in the form of rents, interest and dividends from property valued at about 63.7 billion. It may be argued, and properly, that this class to a large extent occupied houses of its own, the rental value of which does not appear in the income tax returns. Assuming that each of these tax payers owned a \$10,000 house, which is improbable, the total of such real estate would be \$4,370,000,000. Overestimation here may offset in part the neglect of the capital used in private business. On the face of things, therefore, the property belonging to income tax payers aggregated about 68 billion dollars. Making comparison with the physical wealth of 1916, estimated at 268.4 billion dollars for the internal and 0.3 billion dollars for the external, it appears that 1.7 per cent of the population owned about 25 per cent of the total wealth. I am inclined to put this as the minimum limit and say that the class specified owned at least that proportion of the national wealth. By the first method of analysis there has been established the maximum limit of 46 per cent. The truth is probably somewhere between these extremes, but much nearer to the lower than to the higher. A fair guess might be something like 30 per cent.

The Matter of Intangible Wealth

Attention should be drawn here to the distinction between physical or tangible wealth and capitalized wealth, which includes also the intangible. A good illustration of the latter is the value of a newspaper, which may be rated at a high figure without there being much physical property associated with it. The difference between the market value of corporate securities and the physical property owned by the company is ascribable to intangible wealth, which may be a reflection of organization and experience, maybe of good will, maybe of patent rights. If the aggregate market value of a stock be less than the cost or reproduction value of the physical property the chances are that the usefulness of a portion of the latter has disappeared and consequently that some physical value has been extinguished. This may not be the case, however, with respect to public service corporations whose economic freedom is restricted by legislation.

There has never been any estimate of the national wealth that includes the intangible. The aggregate value of the securities of our industrial corporations must logically be in excess of estimates of their physical property. On the other hand, the aggregate market value of the railroad securities is at present inferior, and the same may be true of other kinds of public service corporations. Confusion involving these points may introduce errors in the computations in this paper, but they will not be of serious, certainly not invalidating, nature. If the intangible wealth, pertaining solely

to the industrial enterprises, be guessed at 20 billion dollars on top of the 57 billion of physical, computation by the first method would give 48 per cent instead of 46 per cent; and by the second method, which is founded on capitalization, we should arrive at 23 per cent instead of 25 per cent.

With full recognition of the roughness of the work in this study, I hold it to be sufficient to dispel the idea that something like 65 per cent of the wealth of the United States is owned by less than 2 per cent of the people, and consider that it clears away the seeming paradox between that idea and the established fact that about 70 per cent of the national income, other than agricultural, goes to the wage earners, with only 30 per cent to property and management.* Of that 30 per cent a large part is ascribable to professional and personal earnings and less than half of it to capital, properly speaking.

Wide Diffusion of Wealth

My classification of "the rich" as those who possessed incomes of \$3,000 and upward per annum in 1916 is decidedly a broad one. There were 375,000 income tax payers classed between \$3,000 and \$20,000 per annum in that year, and the aggregate of their income was 40 per cent of the total. I do not mean to fix \$20,000 as the line of demarcation between those who are rich and those who are simply well-to-do, but merely to point out that this exhibition is in line with all the other evidence respecting the great diffusion of wealth in the United States. There is some concentration in great fortunes like those of Henry Ford and John D. Rockefeller, to be sure, but clearly it does not amount to anything like what is popularly supposed.

The two methods of examination that I have used in this paper may be described concisely as (1) analysis of inventory and (2) capitalization of income. These mere descriptions are in themselves convincing as to the soundness of the thought. Pursuance of the latter has not always been satisfactory, owing to the lack of much desirable data. I am therefore conscious of the deficiencies in my study; but I think it is the most helpful adventure into a complicated subject that has been made up to the present time. While there is a good deal in it that is conjectural, there is also a good deal that is positive, especially as to the great percentage to which the farms, livestock, etc., bulk in the total of the national wealth; also the great percentage of the urban real estate and the widespread ownership thereof. The net worth of the farmers of the country, who are not classed among the rich at all, is vast, as has been shown by Dr. Gray. Among the farmers there are inequalities, just as among other people; there are well-to-do farmers and there are tenant farmers who possess but little.

Such concentration of wealth as exists in the United States is nothing that either requires any apology or justifies any attack upon it. In general, the people in the United States who possess wealth have earned it and have saved it out of their thrift. There is an enormous difference in the intelligence and earning capacity of people. The biologists tell us that only about one person out of 6000 in the United States is in the "Who's Who" class. That would imply less than 20,000 of that class in the United States. The number of people who are capable of earning and saving money is much greater than that, but nevertheless it is small in comparison with the total population.

To replace rusted roofing, sheet metal work, plumbing pipe and hardware, home owners last year spent \$626,500,000, according to Thomas A. Brophy, of the Anaconda Copper Mining Co., in a paper before the American Construction Council, New York, Sept. 21.

*This division refers to pre-war conditions. In recent years the proportion to wage-earners has been increasing.

Italian Meeting of Iron and Steel Institute

Technical Discussions at Milan Cover Small Bessemer Practice, Manganese in Steel, Corrosion Effects and Internal Stresses

(Special Correspondence)

MILAN, ITALY, Sept. 20.—The party of members of the (British) Iron and Steel Institute attending the Milan meeting arrived Sunday afternoon, Sept. 16. The American members came on the 17th in time for the opening session. The attendance was about 180. The meetings were held in the hall of the Milan Chamber of Commerce, President Francis Samuelson in the chair. The address of welcome was given by Commander G. E. Falck, chairman of the executive committee, president of the Italian Association of Metallurgical Industries and president of the Lombardy Iron & Steel Works Co. The address in Italian was translated by an able interpreter. Commander C. Vanzetti welcomed the institute on behalf of the Chamber of Commerce and President Samuelson responded happily. The visiting party, he said, were to see this time the iron and steel industry of Italy and not the art, which would take years to see and study. It would be highly interesting, he added, to see the new Italy, that has worked hard to get to the front and has succeeded so remarkably. A little later the newly elected president of the institute for the year coming, Sir William H. Ellis, also expressed his appreciation of the welcome.

The first paper of the session was by Commander Falck, on "The Iron and Steel Industries of Italy." This was discussed by Sir Hugh Bell, who expressed his admiration for the new Italy of work. He said that England had not given Italy any ore, but was sending over coal. In any case, material resources of a country were always overstressed, for in reality it was what a country did with raw materials that counted. Skill was necessary in building up industries. Raw materials could be brought in. He had always found that a country that did much selling in the way of export could be counted upon to buy in return. Sir Hugh Bell then offered a resolution of thanks, which was carried by acclamation.

Manganese Additions to Steel

Prof. F. Giolitti gave a synopsis of his paper on "The Complex Action of Manganese and Other So-Called Deoxidizing Agents in the Manufacture of Steel." In discussing this paper, Dr. L. H. Hatfield stated that it was not enough to look upon the reactions with manganese of the liquid steel as chemical ones, but that many other factors are to be considered, such as the temperature. It was necessary, therefore, to study the situation more from the standpoint of physical chemistry than had been the case heretofore. With oxygen in the steel, manganese became an oxide and it was necessary to study the behavior of this oxide, as well as manganese silicate, when probably in colloidal form. He would like to advance for consideration the fact that when a mold was filled with liquid steel this froze, and the working out of the problems of segregation and liquidation depended much on the temperature at the time. For instance, suppose we had the elimination of all the oxygen and that the steel was very hot. Then freezing would proceed in a desirable way and the impurities would segregate out into the upper part of the ingot. With cold steel, however, what impurities would be segregated would be distributed throughout the ingot. Hence, the necessity of considering such matters in addition to those the author had put forward.

AMERICAN PRACTICE

Dr. John A. Mathews, New York, said that without question manganese has a beneficial effect. The matter is receiving practical consideration in the United

States. Not only does the manganese addition count, but the residual manganese of the finished heat.

J. E. Lester said he had watched the matter for many years and found that it was not so much a question of figures in manganese additions, but rather a question of how the processes were actually carried out. Unless such processes were carried through with the required care, good results would not eventuate from the manganese additions. He considered the bringing up of the entire subject a good one, as it was only by such attention that good steel could be made. There were some new aspects brought out which doubtless had an important bearing upon the production of good steel, and it was not a question of the figures obtained but how they were obtained by a process. He heartily agreed with the author that enough ferromanganese should be added to the bath while it was being stirred, and that there be a final addition in making the refined product. However, he thought the best results were obtained by the addition of enough manganese at the time of working the charge.

E. L. Dupuy (France) said he had made the matter the subject of many researches. He had made oxygen determinations by hydrogen reduction on steel produced by the basic process with the presence of manganese during the whole operation, and when the steel gave good tests some water had been obtained showing the presence of an oxide, either of manganese or silicon. He would ask the author if he thought the good tests were due to a change in the chemical composition or only to its repartition.

EXPERIENCE WITH THE BASIC BESSEMER

C. H. Ridsdale, Middlesbrough, England, said that some years ago in connection with the basic Bessemer process there had been a good deal of oxidized steel, and he had occasion to study very closely the effect of manganese in making the process go right again. As the author had said, it was not altogether the reaction of manganese on the ultimate product, or a simple deoxidation, but the effect of manganese on the working of the process. Very early in his firm's history they had commenced to make what they called "electrical" steel, or "high conductivity" steel as it is now called. It was very low in carbon, about 0.03 per cent, and very low in manganese. When it was rolled, it contained about 0.25 to 0.30 Mn. It would be readily appreciated that starting with a highly oxygenated charge they would get very short material. This could be prevented by adding plenty of manganese at the beginning. They did not possess pig irons such as the minette ores yielded, iron with 1.75 manganese, and it had to be made artificially by the addition of manganese ores, and the iron makers did not always put the full amount in. As a result, all sorts of methods had to be resorted to in order to work up the quality of the iron to make good tough steel that was not dry. One of these methods was to add liquid spiegeleisen at the beginning of the charge, and after the silicon and carbon had been blown out, and a good deal more manganese was then obtained in the bath at the end. It was sometimes necessary to add two or three doses of spiegeleisen during the process to keep the manganese up to 0.20. If it went under 0.20 good "electrical" steel could not be obtained at the finish—not even if plenty of manganese was added at the end to deoxidize well. For years he had analyzed what was called "ooze"—a sort of liquid slag from the top of the ingot, and found that it contained 87 per cent manganese oxide and

about 7 per cent phosphoric acid, with much sulphur. In each case the manganese oxide with the impurities which had been in the steel had liquated out.

Doctor Giolitti in reply confirmed the observations of Doctor Hatfield in regard to liquation. It was quite generally known that in making a steel which would be subjected to transverse action the elimination of the flaky fracture was much easier to obtain when the ingot was poured very hot. This has been remarked by the workmen in the course of their labors. He thanked M. Dupuy for his suggestions and would get at the problem and try to solve it.

Castings from the Small Converter

The paper by Com. C. Vanzetti on "The Manufacture of Heavy Steel Castings from Small Converters" was then read by the author. It was discussed by President-Elect Sir William Ellis, who said he had had a long association, some 25 years, with the small converter process and he regarded it as a convenient system for making castings up to three tons where a variety of castings was to be made and easy control was necessary. Here it was better than the open-hearth furnace, as small shanks could be poured over the lip and the fresh, hot metal could be obtained continually by tilting from the converter as required. Both the Tropenas and the Robert systems were working well in England and France and were deservedly popular.

Doctor Hatfield supported Sir William Ellis. He thought the small converter had advantages over the electric furnace. With regard to the details of the paper, he was of the opinion that the manganese contents of the castings ran a little lower than should be. If instead of 0.20 to 0.50, they had run 0.60 or 0.70, they would have been substantially improved. The material results obtained with castings were largely determined by their heat treatment, and it might be useful if the test made were compared with the annealing process that had been used. Personally, he thought that annealing at 900 deg. C. would eliminate all casting strains with great advantage to the mechanical properties of the castings.

The author, in replying, said he did not believe that the converter was the best means of making steel. In fact, he thought it the worst; but he was desirous of having a system of production by which good results could be obtained. He had treated the subject from the special point of view of a small converter for making, not small, but large castings.

At this point President Samuelson announced the report of the nominating committee, by which Sir William Ellis will be president for the coming year. Sir William expressed his thanks for the honor conferred and mentioned the fact that he would hold the office only one year, thinking it a wise plan that the two-year incumbency had just been changed. He was an engineer and not a metallurgist, but expected to be one by the time his term was up.

Corrosion Cracking and Internal Stresses

Secretary Lloyd read the paper of M. A. Portevain on "The Corrosion Cracking of Steel Under the Influence of Internal Stresses." Doctor Hatfield, in opening the discussion, said that the paper was really the logical working out of the internal stresses in metals generally. A great deal had been done in this direction in bronzes, but little in steel. Just before and during the war great emphasis had been laid upon the importance of the notched test bar. To obtain high values on impact on notched bars it had been found necessary to quench steel from the tempering temperature, and this left internal stresses within the steel of a magnitude far exceeding that which is generally appreciated. In fact, his own experimental work along these lines showed that the internal stresses might, under such conditions, be almost coincident with the yield obtained from the material. It seemed to him that the engineers would seriously have to consider whether the steel should be quenched from the tempering temperature and full of internal strains, or whether they would want the steel slow-cooled, and free from these stresses, though relatively low in impact value. He preferred the latter. He was glad to note by the paper that in

some of the cases where stresses were present—sufficient to produce fracture—corrosion had set in. When corrosion took effect, a concentration of local stresses was involved, and fracture became the logical result.

Doctor Giolitti thought that the importance of the paper rested in the fact that it had been shown that small cracks in steel might have a very great effect on the mass, just as that from large inclusions.

E. L. Dupuy agreed with Doctor Hatfield on the value of the paper to engineers because of the indications it gave as to the value of steels for different purposes. It was impossible to put forward satisfactory results from the same kind of steel used for different purposes. At the present time engineers are adopting this principle, with bad results.

Electric Steel on a Large Scale

In the afternoon conveyances took the party to the new rolling mills and steel works of the Lombardy Iron & Steel Works Co., two of the eight plants being inspected. The outstanding feature was the operation of their very large electric furnaces, several heats of which were tapped and put into ingots at the time of the visit. The open-hearth plant and sheet and rod mills were duly admired. After the inspection the rather large party was entertained at tea by the company, with the usual speeches of felicitation following. In the evening a formal reception was given by the Chamber of Commerce and was greatly enjoyed. The ladies were specially cared for by a committee of ladies of the Milan members. They visited the steel plant and attended the evening reception.

Reports of the technical session on Tuesday morning, Sept. 18, and of the excursion in the afternoon, will appear in THE IRON AGE next week.

British Iron and Steel Market

Japan Has Bought Heavy Tonnages of Galvanized Sheets—Pig Iron Easier—Continental Prices Up (By Cable)

LONDON, ENGLAND, Oct. 2.

Pig iron position is improving on broadening demand, but makers are prepared to grant concessions to clear their stocks. There is more inclination on the part of consumers to contract for forward delivery. The Continent, especially Germany, is purchasing hematite.

Foreign ore still is quiet, but increased activity is anticipated, as the Bilbao strike has ended. Sellers of Bilbao Rubio ask 22½s. to 22¾s. (\$5.11 to \$5.17) ex-ship Tees.

Finished iron and steel generally is quiet, with prices tending lower, owing to cheaper fuel. Far Eastern demand at present is limited to sheets but is expected to develop later. Foreign buyers generally are cautiously awaiting Ruhr developments.

Continental prices are dearer on improving exchange rates and moderate business with India and Japan. In Germany the Donnersmarckhütte works has blown out one blast furnace and reduced the operations of others, owing to prohibitive working costs.

In France and Belgium plans are being formed for the liquidation of the seized Ruhr stocks of iron and steel.

Tin plate market is firm, with good business moving on the basis of the minimum, chiefly for October delivery. But supplies are difficult, owing to the well-sold condition of the works. There is increased activity in most foreign markets and home consumers are covering to the end of the year.

India is buying galvanized sheets in small quantities. The demand, it is anticipated, will develop. Japan has bought heavily of thin gages, paying high prices. The makers are sold out until early next year.

Far Eastern specifications of black sheets have been sold up to £21 (4.26c. per lb.) f.o.b. Early

supplies are difficult to obtain. India is buying moderately.

We quote per gross ton, except where otherwise stated, f.o.b. makers' works, with American equivalent figured at \$4.54 per £1, as follows:

Durham coke, delivered	£1 19s.	to £2 0s.	\$8.85 to \$9.08
Bilbao Rubio ore	1 4		5.45
Cleveland No. 1 foundry	5 2		23.15
Cleveland No. 3 foundry	4 16½		21.91
Cleveland No. 4 foundry	4 11		20.66
Cleveland No. 4 forge	4 9	to 4 10	20.20 to 20.43
Cleveland basic	4 10	to 4 14	20.43 to 21.34
East Coast mixed	4 18½	to 5 0	22.36 to 22.70
Ferromanganese	17 10		79.45
Ferromanganese*	17 10		79.45
Rails, 60 lb. and up	8 0	to 9 0	36.32 to 40.86
Billets	7 10	to 8 5	34.05 to 37.46
Sheet and tin plate bars,			
Welsh	9 2½		41.43
Tin plates, base box	1 3½	to 1 3¼	5.35 to 5.38
Ship plates	9 2½	to 9 12½	1.85 to 1.95
Boiler plates	12 10	to 13 0	2.53 to 2.63
Tees	9 12½	to 10 2½	1.95 to 2.05
Channels	8 17½	to 9 7½	1.80 to 1.90
Beams	8 12½	to 9 2½	1.75 to 1.85
Round bars, ½ to 3 in.	10 10	to 11 0	2.13 to 2.23
Galvanized sheets, 24 g.	18 10	to 18 15	3.75 to 3.80
Black sheets, 24 gage	13 15		2.79
Black sheets, Japanese			
specifications	15 5		3.09
Steel hoops	12 0	& 12 10*	2.43 & 2.53*
Cold rolled steel strip,			
20 gage	17 5		3.50
Cotton ties, Indian speci-			
fications	15 0		3.04

*Export price. †Ex-ship. Tees, nominal.

Continental Prices, All F. O. B. Channel Ports

Foundry pig iron:			
Belgium	£5 2½s.		\$23.15
France	5 2½		23.15
Luxemburg	5 2½		23.15
Billets:			
Belgium	6 12½	to £7 0s.	30.08 to 31.78
France	6 12½	to 7 0	30.08 to 31.78
Merchant bars:			
Belgium	8 7½	to 9 0	1.70 to 1.82
Luxemburg	8 7½	to 9 0	1.70 to 1.82
France	7 10		1.52
Belgium	7 15		1.57
Luxemburg	7 12½		1.55
France	7 10	to 7 12½	1.52 to 1.55
Angles:			
Belgium	8 0	to 8 5	1.62 to 1.67
¼-in. plates:			
Belgium	8 10		1.72
Germany	8 10		1.72
¾-in. plates:			
Luxemburg	7 15		1.57
Belgium	8 0		1.62

IRON AND STEEL INSTITUTE

After Meeting in New York, Members Will Visit • Aberdeen Proving Grounds

The twenty-fourth general meeting of the American Iron and Steel Institute will be held at the Hotel Commodore, New York, Thursday, Oct. 25. The papers to be read at the morning and afternoon sessions following the address by President Gary are:

- X-Ray Examination of Metals, Col. T. C. Dickson, commanding officer, Watertown Arsenal, Watertown, Mass.
- Investigation of the Influence of Temperature on Charpy Impact Value of a Group of Steels of Varying Composition, Dr. F. C. Langenberg, metallurgist, Watertown Arsenal, Watertown, Mass.
- Open-Hearth Furnace Regenerators, F. B. Quigley, superintendent, open-hearth department, Ohio Works, Carnegie Steel Co., Youngstown, Ohio.
- Iron and Steel Industry in China, Chung Yu Wang, Hankow, China.
- The Use of Blast Furnace Slag for Various Construction Purposes, C. L. McKenzie, president, Duquesne Slag Products Co., Pittsburgh.
- Recent Developments in Steel Forging, John L. Cox, assistant to president, Midvale Co., Philadelphia.

Following the banquet, which will be held in the evening at the Hotel Commodore, a special train will be run to Aberdeen, Md., and on Friday, Oct. 26, the institute will hold a joint meeting with the Army Ordnance Association at the United States Army Proving Grounds at Aberdeen. The program for the joint meeting on Friday will be devoted to demonstrations of the use of ordnance material by the services which actually use it in battle: artillery, infantry, air service, etc. The program will include the firing of heavy railroad

FRENCH MARKET FIRM

Prices Move Upward with Mills Well Booked Ahead, but Consumers Refrain from Stocking, Anticipating Disposal of Ruhr Seizures

PARIS, FRANCE, Sept. 21.—There is a feeling among the larger consumers that even though a satisfactory arrangement is made with Germany coke will continue scarce and expensive for some time and exchange will continue high. In the domestic market, disposals in raw, semi-finished and finished products are limited, as a result of heavy exports and finishing mills are beginning to complain of this shortage which is leading to higher prices. A change may come, however, if the iron and steel products seized in the Ruhr are sold on the market at reasonable prices. There is no reason, under such conditions, for consumers to build up large stocks of supplies, since a shortage is not to be feared; on the contrary, any unconsidered hastiness on their part would mean another increase in the prices.

Pig Iron.—The production for August is about equal to that of July. But owing to the active demand, especially for export, prices continue firm with an upward tendency. Some transactions were made during the past week at 420 fr. for No. 3 P. L., September delivery. This price has since been advanced to 430 and 435 fr., f.o.b. East Works, although tonnage has been accepted at 420 and 425 fr., September-October delivery, by East and Lorraine Works. October orders are being booked at 450 fr. per metric ton, at works, for No. 3 P. L. The price for August for No. 3 P. L. phosphorus iron was established at 414.60 fr. per ton, to the co-operative of the French Foundrymen's Association. Hematite is quoted in the East at 500 fr. per ton, f.o.b. works. However, small tonnages can still be had both in the Center and North for 460 and 490 fr. per ton, at works. British hematite, East Coast mixed numbers, is sold on the Paris market for 510 to 515 fr. per ton, delivered.

Ferroalloys.—Sept. 19, the French Comptoir for ferrosilicon advanced the price of 45 per cent to 1050 fr., an increase of 25 fr. per metric ton.

mortars and guns, dropping of bombs from bombing airplanes, firing of anti-aircraft guns against moving targets in the air, demonstration of machine gun firing from airplanes, and machine gun barrages on land, the attack of tanks against machine gun nests, etc. It is expected that a large number of the members of the institute will avail themselves of this opportunity to witness these very interesting demonstrations.

Malleable Castings in August

WASHINGTON, D. C., Sept. 29.—The Department of Commerce announces statistics on the production of malleable castings manufactured for sale, by months, which include only those castings manufactured for sale as such, and do not include those used in the plant or finished and sold as other products:

Figures are also shown comparatively for June, July and August, covering the operations of 103 identical establishments for which reports were received each month:

Production of Malleable Castings by Months						
Month	Plants Reporting	Total Production, Tons	Total Shipments, Tons	Orders Booked, Tons	Monthly Capacity of Plants, Tons	Per Cent of Total Capacity Operated
May	95	64,726	62,806	52,898	91,174	71.0
June	105	65,168	64,608	42,967	96,240	67.7
July	108	57,881	60,162	41,723	98,241	58.9
Aug.	112	68,069	65,405	39,820	103,068	66.0

Comparative Summary for 103 Identical Establishments						
Month	Plants Reporting	Total Production, Tons	Total Shipments, Tons	Orders Booked, Tons	Monthly Capacity of Plants, Tons	Per Cent of Total Capacity Operated
June	103	63,298	62,888	39,814	94,840	66.7
July	103	54,433	55,922	39,131	94,826	57.4
Aug.	103	63,033	60,207	36,753	94,858	66.5

Electrical Engineers Hold Convention

Buffalo Meeting and Exhibition Draw Many Visitors—Technical Sessions and Discussions Well Attended—Operating Electric Foundry a Great Drawing Card

WITH an attendance which reached 1076 members out of a total of between 1500 and 1600, and with 15 past-presidents present out of 17, the Buffalo convention, Sept. 24 to 28, of the Association of Iron and Steel Electrical Engineers made a new high record in the history of the association. Expanding activities were shown, particularly by the character and scope of the exhibition in the Broadway Auditorium, while increase in the breadth of the technical interest was indicated by the special fuel section, and the papers and discussions brought together under that heading. The chairman of this section is George R. McDermott, assistant chief engineer Illinois Steel Co., South Chicago, who was a recipient of the Hadfield medal for his paper before the American Iron and Steel Institute last year.

The program of the meeting was published on page 402, in our issue of Aug. 16, and the brief record of the first two days' sessions appeared on page 849 of our issue of Sept. 27. Lack of space prevents the publication in this issue of some of the outstanding papers before the convention. On page 906, however, will be found an abstract of the report of the committee on anti-friction bearings and some of the recommendations for standardization. This is followed by the discussion on the report and recommendations. Discussions of other papers read before the convention will follow the abstracts of those papers, as we publish them in the next few issues.

Exhibition a Great Success

Many more of the members of the association were to be found going over portions of the exhibition on the main floor of the Auditorium than were present at any of the technical meetings in the second story of that building. The entire floor, consisting of about 170 booths, was occupied, the total number of exhibitors being about 125. Several had two booths and the two large electrical supply companies—Westinghouse Electric & Mfg. Co. and General Electric Co.—occupied ten booths each.

The Electrified Foundry

Chief in interest and a never failing attraction for visitors was the electrified foundry, organized by the Pittsburgh Electric Furnace Corporation and operated by the American Radiator Co., Buffalo plant. From the delivery of scrap to the furnace, until the final grinding of burrs from the castings, this unit was electrically operated throughout.

More than a score of companies cooperated in this particular unit, including the Acheson Graphite Co., Niagara Falls, N. Y., furnace electrodes; Air Reduction Sales Co., New York, cutting-off torch; Automatic Transportation Co., Buffalo, storage battery industrial trucks; Bridgeport Safety Emery Wheel Co., Bridgeport, Conn., grinding wheels and stands; Buffalo Scale Co., platform scales; Cleveland Pneumatic Tool Co., air manifolds, valves, couplings and hose; Cutler-Hammer Mfg. Co., Milwaukee, lifting magnets; Electrometallurgical Corporation, New York, ferroalloys; George J. Hagan Co., Pittsburgh, electric annealing furnace; Harbison-Walker Refractories Co., Pittsburgh, furnace refractories; Mahr Mfg. Co., Minneapolis, ladle heater; National Engineering Co., Chicago, sand mill; Ohio Steel Foundries, Springville, Ohio, Fahrite annealing box; George Oldham & Son Co., Baltimore, chipping hammers and sand rammers; Osborn Mfg. Co., Cleveland, two molding machines; Pangborn Corporation, Hagerstown, Md., sand blast and dust-arrester, angular grit and Simpson steel shot; Pittsburgh Transformer

Co., electric furnace transformer; Shepard Electric Crane & Hoist Co., Montour Falls, N. Y., overhead traveling crane and runway; Truscon Steel Co., Youngstown, Ohio, pressed steel flasks and bottom boards; Venango Sand Co., Franklin, Pa., foundry sand; Westinghouse Electric & Mfg. Co., East Pittsburgh, electric furnace automatic control switches and motors; Whiting Corporation, Harvey, Ill., ladles; Worthington Pump & Machinery Corporation, Cincinnati, Laidlaw variable capacity compressor and Maxim silencer.

Melting was accomplished in a Moore "Rapid Lectromelt" furnace using a current at 128 volts high circuit and 80 volts during melt, the current flow being at about 600 amperes with high voltage and 800 amperes during melting. This current came in at 2200 volts and was handled through the Pittsburgh transformer. The Buffalo city authorities made arrangements, previous to the opening of the exposition, for getting in this high tension current for this purpose. Heats were poured at frequent intervals, the furnace furnishing $\frac{1}{2}$ ton of metal at each heat. The entire operation of a foundry was carried through to the production of the finished castings, the whole unit being operated on a brick floor measuring about 35 x 65 ft., spanned by the overhead crane and broken only by the concrete ladle pit in front of the furnace.

Exhibits in Booths

While the exhibits were decidedly diversified, they naturally grouped themselves into a number of classes according to the character of the product exhibited. Space does not permit extended treatment but, in brief, the principal features covered are included in the following paragraphs:

Cranes and hoisting apparatus were shown by the Alliance Machine Co., Alliance, Ohio, which had models of two types of ingot strippers, two types of ladle cranes, a soaking pit crane and a two-car dumping machine for handling ore or coal. The Hayward Co., New York, showed in operation handling sand an electrically operated clam shell bucket suspended from a crane bridge. The Shepard Electric Crane & Hoist Co., Montour Falls, N. Y., had the 5-ton overhead crane operating in the foundry exhibit and, in addition, two types of 1-ton hoists and two types of 2-ton hoists. The Motor-bloc Corporation, Philadelphia, showed motor-driven differential blocks, and the Otis Elevator Co., New York, elevating equipment.

Electrically driven trucks, tractors and portable cranes were shown by six exhibitors. The Automatic Transportation Co., Buffalo, had a 3-ton elevating platform truck and a fork platform tiering lifting truck of 2 tons capacity, capable of raising from 1 to 6 ft. These were in connection with the foundry show. Baker R & L Co., Cleveland, showed three machines—an industrial tractor, a truck and a crane truck. The Elwell-Parker Electric Co., Cleveland, had a 3000-lb. electric revolving crane and a 3-ton electric lift truck. The Lakewood Engineering Co., Cleveland, showed industrial trucks. The Mercury Mfg. Co., Chicago, showed a tractor and trailer. The Wright-Hibbard Industrial Electric Truck Co., Buffalo, was the sixth exhibitor.

Electric portable tools were shown by the Chicago Pneumatic Tool Co., New York; the Cleveland Pneumatic Tool Co., Cleveland, and the Van Dorn Electric Tool Co., Cleveland.

Boilers, furnaces and parts were shown by the American Heat Economy Bureau, Pittsburgh; the George J. Hagan Co., Pittsburgh; the Liptak Fire Brick Arch Co., Chicago, and the Superheater Co., New York. Other

companies, including the Wickes Boiler Co., Saginaw, Mich., were represented by drawings or catalogs.

Gears of various types were shown by the Farrel Foundry & Machine Co., Ansonia, Conn. (shown by Buffalo plant); by R. G. Nuttall Co., Pittsburgh; W. P. Taylor Co., Buffalo, and the Tool Steel Gear & Pinion Co., Cincinnati. The Sykes double helical gear with sharp apices, the whole tooth being generated right up into the corner and having no center gap, attracted much attention.

Flexible couplings were exhibited by the Thomas Flexible Coupling Co., Warren, Pa., and the Bartlett Hayward Co., New York.

Anti-friction bearings were shown by the Hyatt Roller Bearing Co., New York; Norma Co. of America, New York; the Rollway Bearing Co., Syracuse, N. Y.; and the S. K. F. Industries, Inc., Hartford, Conn.

Valves were shown by the Chapman Valve Mfg. Co., Indian Orchard, Mass., and the Homestead Valve Mfg. Co., Pittsburgh.

Metals as such were represented by the Park Metalware Co., Buffalo, by the metallic packing of the France Packing Co., Philadelphia, and by the bearing metals of the Lumen Bearing Co., Buffalo, and of the Sumet Corporation, Buffalo.

Oils, either lubricating or fuel or both, were shown, together with the action of lubricating oils, by the Keystone Lubricating Co., Philadelphia, the Standard Oil Co., New York, and the Tide Water Oil Sales Corporation, New York.

Other exhibits included the Aero Pulverizer Co., New York, coal pulverizer and blower; Allis-Chalmers Mfg. Co., Milwaukee, impulse steam turbine for auxiliary equipment; Hagan Corporation, Pittsburgh, boiler regulation system and gas controllers; Johns-Manville, Inc., New York, insulating materials; William Reed Engineering Co., Louisville, Ky., air filter; Spencer Turbine Co., Hartford, Conn., turbo compressors; M. H. Detrick Co., Chicago; Gas Combustion Co., Pittsburgh; MacLeod Co., Cincinnati; Mutual Foundry & Machine Co., Atlanta, Ga.; Stroh Steel Hardness Process Co., Pittsburgh.

Aside from the great variety of electrical instruments, shown by exhibitors whose business is devoted to electrical matters, there were other types of instruments shown by the Bacharach Industrial Instrument Co., Pittsburgh, the Northern Equipment Co., Erie, Pa., and the Republic Flow Meter Co., Chicago.

Electrical Apparatus

Among the important electrical applications may be mentioned the exhibits of the Crocker-Wheeler Co., Ampere, N. J., with mill type motors and induction motors for mill uses; Cutler-Hammer Mfg. Co., Milwaukee, with various control devices and heating elements, including heated plates on which chocolate creams were made and distributed to visitors; the Ohio Electric & Controller Co., Cleveland, magnetic switch controller and electric magnets; Rowan Controller Co., Baltimore, mill table controller with starter and switches; and United States Graphite Co., with a group of graphite products, particularly applicable to the iron and steel industry, including motor and generator brushes.

Electric equipment of all sorts, some of it specifically designed for steel mill use but most of it general in application, was exhibited by a large number of companies, including Allan Mfg. & Welding Co., Buffalo; Louis Allis Co., Milwaukee; Appleton Electric Co., Chicago; Automatic Reclosing Circuit Breaker Co., Columbus, Ohio; Benjamin Electric Mfg. Co., Chicago; Boxill-Bruel Carbon Brush Co., Indianapolis; Bussman Mfg. Co., St. Louis; Chicago Fuse Co., Chicago; Corliss Carbon Co., Bradford, Pa.; Crouse-Hinds Co., Syracuse; Cutter Electrical & Mfg. Co., Philadelphia; Delta-Star Electric Co., Chicago; Economy Fuse & Mfg. Co., Chicago; Edison Storage Battery Co., Philadelphia; Electric Controller & Mfg. Co., Cleveland; Electric Materials Co., North East, Pa.; Electrical Power Equipment Corporation, Philadelphia; Electric Service Supplies Co.,

Philadelphia; Electric Storage Battery Co., Philadelphia; Electro-Service Co., Marietta, Ga.; Johns-Pratt Co., Hartford, Conn.; Martindale Electric Co., Cleveland; William G. Merowit, Buffalo; Mutual Electric & Machine Co., Detroit; National Carbon Co., Cleveland; National Electrical Mfg. Co., New York; Nichols-Lintern Co., Cleveland; Packard Electric Co., Warren, Ohio; Pittsburgh Electric & Machine Works, Pittsburgh; Pyle National Co., Chicago; Reliance Electric & Engineering Co., Cleveland; Rockbestos Products Corporation, Buffalo; Schweitzer & Conrad, Inc., Chicago; Square D Co., Detroit; Standard Underground Cable Co., Pittsburgh; Thompson Electric Co., Cleveland; Trumbull Electric Mfg. Co., Plainville, Conn.; V. V. Fittings Co., Philadelphia; Western Electric Co., Chicago.

The Banquet

At the Hotel Statler, Thursday evening, the ballroom was thoroughly filled with members and guests at the annual banquet. The toastmaster, George Leahman, general manager Buffalo Chamber of Commerce, told the guests that Buffalo is in process of switching from a commercial center to a manufacturing center of the first importance. Formerly the city took toll of what commerce passed through between the Great Lakes district and the Atlantic seaboard. Already, however, the city stands eighth in the value of its manufactured products and the industrial plants centered around Niagara Falls, and deriving cheap electric power from that development, make that section the most rapidly growing in the United States.

Other speakers included R. B. Gerhardt, retiring president of the association and assistant general manager Sparrows Point plant, Bethlehem Steel Corporation; R. S. Shoemaker, the new president of the association, and superintendent of maintenance American Rolling Mill Co., Middletown, Ohio; Frank X. Schwab, Mayor of Buffalo; Frank A. Baird, a veteran blast furnace man of Buffalo; Hugh Kennedy, vice-president Rogers-Brown Iron Co., Buffalo; and Douglas Malloch, international humorist, Chicago.

Mr. Baird told the story of Buffalo's connection with the iron and steel industry. Forty years ago not a ton of iron or steel was made in Buffalo—this in spite of the fact that it had been made there in large quantities before that time. After the Civil War, Mr. Carnegie looked over Buffalo as a manufacturing site. There were being produced there the largest iron structural beams in America, 16 in. in depth, but the old-fashioned anthracite method was in use and the metal was being fashioned into beams and rails of iron. Long after iron rails had ceased to be produced elsewhere, Buffalo was making them. Eventually these firms failed. In contradistinction, the Carnegie Steel Co. set up the first steel mill chemical laboratory in America, while Buffalo was still running on rule of thumb methods. All of this helped in Buffalo's downfall and for 10 years there was no iron and steel produced within the city limits. Today there are 23 blast furnaces within five or six miles of the City Hall.

Mr. Kennedy expressed great impatience with the people who have criticized the steel industry on account of long hours and alleged inhuman working conditions. He pointed out that 40 years ago, when he entered the industry, and kept Mr. Schwab's time, such criticism would have been valid, but it was not made. The A furnace at Braddock had been transported from Michigan and was the first American furnace operated on ferromanganese. It was using Spanish ores; every bit of material was moved by hand in wheelbarrows and otherwise, and largely by the use of Irish labor. Physical human endurance alone limited production. That slavery of 40 years ago has all disappeared, because of the work of engineers and of the electricity which they have harnessed. Today not a pound of the materials going into the blast furnace is touched by the hand of man. All is handled by machinery, and yet today, with conditions like that, people harp on what a "hard job" men have who work in iron and steel plants.

SEPTEMBER IRON OUTPUT

Decline From August 7090 Tons Per Day
—Rates Down to Lowest of the YearEighteen Furnaces Down or Banked and Three
Blown In—Net Loss of 15

Still further decline in the pig iron output of this country was registered in September. According to blast furnace statistics, gathered almost entirely by telegraph, the daily rate fell practically to the lowest for the year, or only 3 tons more per day than the rate in January. With the net loss of 15 furnaces in blast on Oct. 1, the loss for the last three months amounts to 68 furnaces since July 1. The loss in output per day in September was 7090 tons, as compared with 7382 tons per day in August, and 3892 tons per day in July.

Production of coke and anthracite pig iron for the 30 days in September amounted to 3,125,512 gross tons, or 104,184 tons per day, as compared with 3,449,493 tons (revised figures) in August, a 31-day month, or 111,274 tons per day. The September decrease from August was 323,981 tons, or 7090 tons per day. There were 18 furnaces blown out, or banked and three blown in, a net loss of 15 furnaces.

The total number of furnaces in blast on Oct. 1, was 255, as compared with 270 on Sept. 1. The capacity of the 255 furnaces operating Oct. 1 is estimated at about 102,000 tons per day, as compared with 106,590 tons per day for the 270 furnaces operating on Sept. 1.

There was a large production of ferromanganese in September, at 23,206 tons, next to the largest for any month this year. The spiegeleisen output was low at 4,478 tons.

Daily Rate of Production

The daily rate of production of coke and anthracite pig iron months, from September, 1922, is as follows:

Daily Rate of Pig Iron Production by Months—Gross Tons			
	Steel Works	Merchant	Total
September, 1922	53,856	13,935	67,791
October	66,060	19,032	85,092
November	72,177	22,813	94,990
December	75,179	24,398	99,577
January, 1923	79,991	24,190	104,181
February	80,684	26,251	106,935
March	87,881	25,792	113,673
April	90,145	28,179	118,324
May	96,029	28,735	124,764
June	90,907	31,641	122,548
July	88,798	29,858	118,656
August	86,479	24,795	111,274
September	78,799	25,385	104,184

The figures for daily average production, beginning with January, 1917, are as follows:

Daily Average Production of Coke and Anthracite Pig Iron in the United States by Months Since Jan. 1, 1917—Gross Tons										
	1917	1918	1919	1920	1921	1922	1923			
Jan.	101,643	77,799	106,525	97,264	77,945	53,063	104,181			
Feb.	94,473	82,835	105,006	102,720	69,187	58,214	106,935			
Mar.	104,882	103,648	99,685	108,900	51,468	65,675	113,673			
Apr.	111,165	109,607	82,607	91,327	39,768	69,070	118,324			
May	110,238	111,175	68,002	96,312	39,394	74,409	124,764			
June	109,002	110,793	70,495	101,451	35,494	78,701	122,580			
July	107,820	110,354	78,340	98,931	27,889	77,592	118,656			
Aug.	104,772	109,341	88,496	101,529	30,780	58,586	111,274			
Sept.	104,465	113,942	82,932	104,310	32,850	67,791	104,184			
Oct.	106,550	112,482	60,115	106,212	40,215	85,092				
Nov.	106,859	111,802	79,745	97,830	47,183	94,990				
Dec.	92,997	110,762	84,944	87,222	53,196	99,577				
Year	104,619	105,496	83,789	99,492	45,325	73,645				

Production of Steel Companies—Gross Tons

Returns from all furnaces of the United States Steel Corporation and the various independent steel companies, as well as from merchant furnaces producing ferromanganese and spiegeleisen, show the foregoing totals of steel making iron, month by month, together with ferromanganese and spiegeleisen. These

Production of Steel Companies—Gross Tons

	Total Production		Spiegeleisen and Ferromanganese			
	1922	1923	1922	1923	1922	1923
Jan.	1,306,045	2,479,727	6,874	1,230	19,358	12,056
Feb.	1,311,170	2,259,154	3,610	4,930	21,282	3,657
Mar.	1,629,982	2,724,305	11,600	2,095	20,730	13,832
Apr.	1,707,902	2,704,360	14,998	4,211	20,808	7,440
May	1,879,180	2,976,892	15,432	4,902	19,568	9,533
June	1,876,033	2,727,208	18,273	4,817	19,717	18,289
6 mos.	9,710,312	15,871,646	70,787	22,185	121,564	64,807
July	1,931,138	2,752,738	18,873	7,176	26,493	12,876
Aug.	1,415,832	2,680,851	11,402	7,925	22,045	5,586
Sept.	1,615,696	2,363,967	10,681	4,235	23,206	4,478
Oct.	2,047,873	.....	9,193	12,283	.....	.....
Nov.	2,165,295	.....	13,232	4,192	.....	.....
Dec.	2,330,545	.....	17,007	10,591	.....	.....
Year	21,216,691	.....	151,175	68,587	.....	.....
9 mos.	23,669,202	.....	.....	.....	193,308	87,747

last while stated separately, are also included in the columns of "total production."

Output by Districts

The accompanying table gives the production of all coke and anthracite furnaces for September and the three months preceding:

Pig Iron Production by Districts, Gross Tons

	Sept. (30 days)	Aug. (31 days)	July (31 days)	June (30 days)
New York	208,737	246,347	265,406	253,625
New Jersey	18,293	19,449	18,920	26,033
Lehigh Valley	73,945	79,529	90,231	91,078
Schuylkill Valley	88,699	108,448	116,428	117,779
Lower Susquehanna and Lebanon Valleys	56,531	56,884	74,645	64,374
Pittsburgh district	659,963	713,314	759,159	737,839
Shenango Valley	127,781	117,133	142,419	164,969
Western Pa.	157,960	193,611	205,059	201,026
Maryland, Virginia and Kentucky	55,581	81,826	91,443	89,164
Wheeling district	147,771	159,418	155,324	149,067
Mahoning Valley	286,558	338,466	366,681	378,170
Central and Northern Ohio	273,885	287,641	286,021	289,498
Southern Ohio	37,416	46,779	72,120	74,798
Illinois and Indiana	587,323	631,225	643,043	620,281
Mich., Minn., Mo., Wis. and Colo.	113,460	121,172	139,330	159,254
Alabama	213,083	230,468	236,049	239,589
Tennessee	18,526	17,783	16,056	19,901
Total	3,125,512	3,449,493	3,678,334	3,676,445

Among the furnaces blown in during September were the following: Buffalo C furnace in the Buffalo district; the Sharpsville furnace in the Shenango Valley, and one Ashland furnace of the American Rolling Mill Co. in Kentucky.

Among the furnaces blown out or banked during September were the following: F furnace of the Bethlehem Steel Co. and the Buffalo B furnace in the Buffalo district; C furnace of the Bethlehem Steel Co. at Coatesville in the Schuylkill Valley; the Edgar Thomson D furnace of the Carnegie Steel Co. in the Pittsburgh district; Nos. 1 and 2 Newcastle furnaces of the Carnegie Steel Co. in the Shenango Valley; J furnace of the Bethlehem Steel Co. at Johnstown in western Pennsylvania; the Pulaski furnace in Virginia; E furnace of the Bethlehem Steel Co. at Sparrows Point, Md.; the McKeefrey and Mattie furnaces in the Mahoning Valley; Dover furnace in northern Ohio; the second Wellston furnace in southern Ohio; No. 8 South Chicago furnace of the Illinois Steel Co. and No. 4 Iroquois furnace of the Youngstown Sheet & Tube Co. in the Chicago district; the Philadelphia and No. 1 City furnace of the Sloss-Sheffield Steel & Iron Co. and the second Vanderbilt furnace of the Woodward Iron Co. in Alabama.

The fluctuations in pig iron production from 1913 to the present time are shown in the accompanying chart. The figures represented by the heavy lines are those of the daily average production, by months, of coke and anthracite iron. The dotted curve on the chart represents monthly average prices of Southern No. 2 foundry pig iron at Cincinnati, local No. 2 foundry iron at furnaces in Chicago, and No2X at Philadelphia. They are based on the weekly quotations of THE IRON AGE.

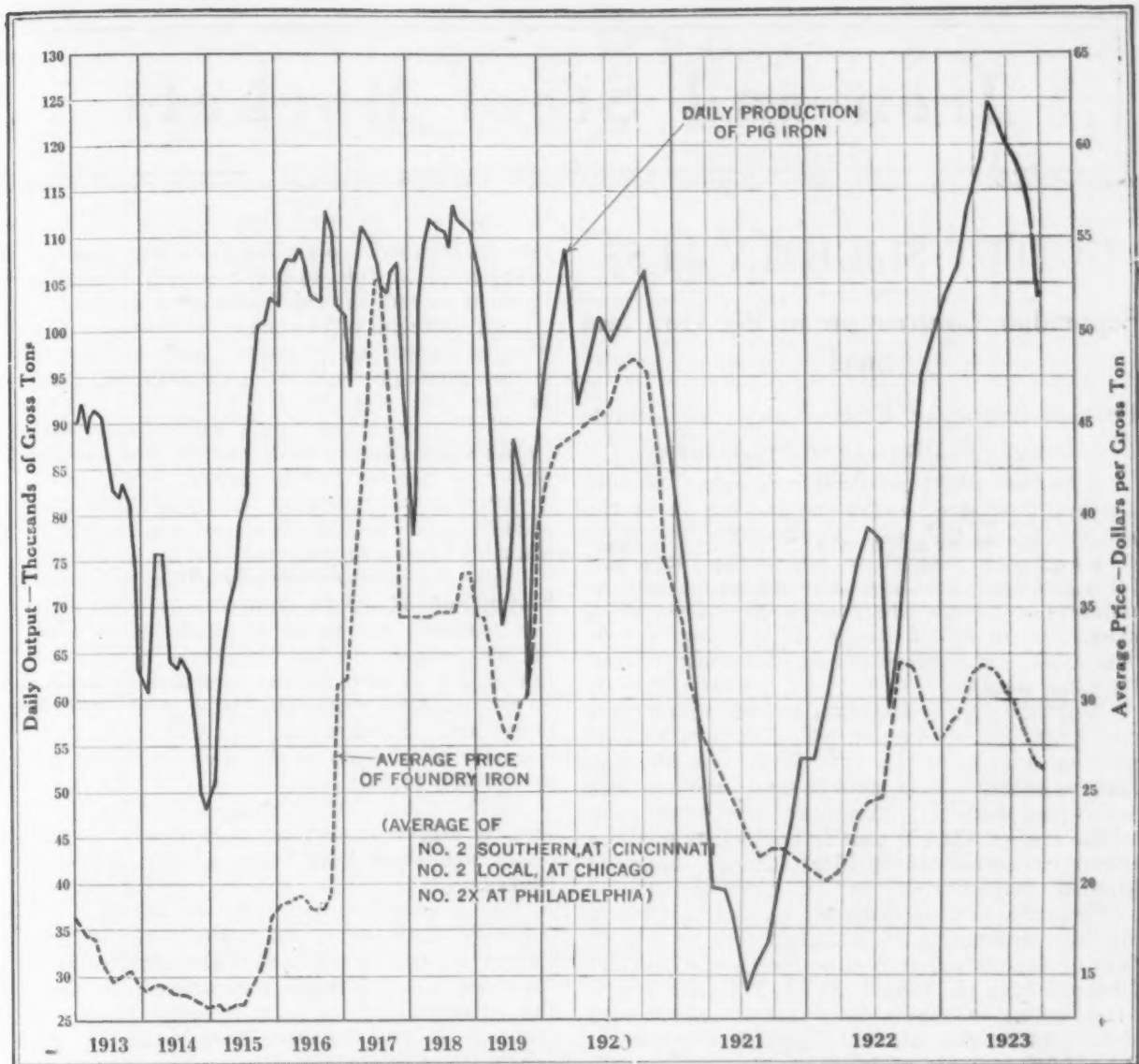


Diagram of Pig Iron Production and Price

Production of Coke and Anthracite Pig Iron in the United States by Months, Beginning Jan. 1, 1919—Gross Tons

	1919	1920	1921	1922	1923
Jan. ...	3,302,260	3,015,181	2,416,292	1,644,951	3,229,604
Feb. ...	2,940,168	2,978,879	1,937,257	1,629,991	2,994,187
Mar. ...	3,090,243	3,375,907	1,595,522	2,035,920	3,523,868
Apr. ...	2,478,218	2,739,797	1,193,041	2,072,114	3,549,736
May ...	2,108,056	2,985,682	1,221,221	2,306,679	3,867,694
June ...	2,114,863	3,043,540	1,064,833	2,361,028	3,676,445
½ year.	16,033,808	18,138,986	9,428,166	12,050,683	20,841,534
July ...	2,428,541	3,067,043	864,555	2,405,365	3,678,334
Aug. ...	2,743,388	3,147,402	954,193	1,816,170	3,449,493
Sept. ...	2,487,965	3,129,323	985,529	2,033,720	3,125,512
Oct. ...	1,863,558	3,292,597	1,246,676	2,637,844	.....
Nov. ...	2,392,350	2,934,908	1,415,481	2,849,703	.....
Dec. ...	2,633,268	2,703,855	1,469,086	3,086,898	.....
Year*	30,582,878	36,414,114	16,543,686	26,880,383	.....

*These totals do not include charcoal pig iron. The 1922 production of this iron was 224,731 tons.

The Selflock Nut & Bolt Co., Inc., East Syracuse, N. Y., manufacturer of friction fit nuts and bolts, has entered into a contract with the Bethlehem Steel Co., Bethlehem, Pa., operative at once, for the manufacture and sale of carriage and machine bolts, track bolts, and heavy railroad nuts and bolts. The Selflock company will increase its facilities and will specialize on S. A. E. selflock products and cap screws with selflock threads.

John H. Bricker, Philadelphia, has changed address from 51 Estey Building to 816 Otis Building.

Slight Increase in Buying Reported at Youngstown

YOUNGSTOWN, Oct. 2.—A fair volume of steel business through the fall and winter months, with an appreciable improvement next spring, is the anticipation of President James A. Campbell of the Youngstown Sheet & Tube Co. He also says there is little or no price shading by the leading interests.

Some quickening in iron and steel demand is reported by other Valley executives. Somewhat better black sheet buying is reported by independent interests, which have heretofore complained of the apathy existing in this market.

Requirements for standard merchant pipe are holding fairly well, and business of this kind is reported in sufficient volume to maintain tube mill departments at a fair rate through the remainder of the year.

There is speculation as to the operating rate which the mills can be expected to maintain through the winter, leading steel makers being of the opinion this will average 70 to 75 per cent. in finishing departments.

While the pig iron market is still slack, there has been some reduction in accumulated stocks, especially by merchant interests in the past six weeks, owing to suspension of production. Orders meanwhile have been filled from stocks in the yards.

There is less evidence in this district that semi-finished steel is moving below \$42.50, which makers seek to establish as the fourth quarter price, both nominally and actually.

Railroads are handling the large volume of traffic in and out of the Valley expeditiously, and no car shortages or inadequacies in motive equipment are reported.

Iron and Steel Markets

OUTPUT SLIGHTLY LESS

September Contraction in Pig Iron and Steel

Further Buying of Rails—Hoops and Bands Lower—Pig Iron Decline Continues

A further slight contraction in output of both pig iron and steel marks the coming in of the last quarter of the year. Consumption continues at a high rate, though in some lines there is a falling off from that of early summer, and neither sellers nor buyers are forcing the issue as to prices for forward delivery. It is recognized on both sides that September conditions may prevail for some weeks.

September pig iron output fell off about 6 per cent from that of August, which in turn was 6.5 per cent less than the July total. As showing that the contraction is more in steel products than in foundry work it is significant that practically all the loss of 324,000 tons in September pig iron output is contributed by blast furnaces operated by steel companies.

Complete returns compiled on Oct. 2 show a pig iron production of 3,125,512 tons in the 30 days of September, or 104,184 tons a day, against 3,449,493 tons in August, or 111,274 tons a day. After having reached a daily rate of 124,000 tons at the peak in May, pig iron output is now back to the 104,000-ton rate of January.

Eighteen furnaces were blown out in September and 3 were blown in. The 255 in blast Oct. 1 represent a daily capacity of about 101,000 tons, against 106,590 tons for the 270 furnaces in blast one month previous.

September operations of the Steel Corporation are estimated at about 87 per cent of its steel making capacity. If the 31,000-ton daily rate of new bookings which the corporation announced for the first three weeks of the month held up to the end, the net reduction in unfilled orders was considerably under the 495,000 tons reported for August.

Output of independent steel companies averaged not far from 70 per cent of capacity last month, and the improvement of that rate in October will call for an early picking up in the major tonnage products—plates, shapes and bars.

While railroad car buying and oil tank contracts are absent, Chicago district mills are still booking rails, the total already taken for the first half of 1924 being put at 250,000 tons. The C. & O. has just ordered 17,000 tons at Chicago and 13,000 tons in the East. The Missouri Pacific is expected to buy 30,000 tons, and other roads yet to contract are the Chicago & Northwestern, Nickel Plate, Santa Fe, Rock Island, Missouri, Kansas & Texas, Cotton Belt and Pennsylvania.

Pittsburgh reports still feature wrought pipe and tin plate as the most active lines. The report of the National Association of Sheet and Tin Plate Manufacturers is expected to show September orders were nearly double those of August. Re-

cent orders for tin plate for China and Japan have been taken at full domestic prices, indicating a stronger market for the Welsh product.

The principal price change in the week is a decline of \$3 per ton in hoops, bands and hot-rolled strips, these products being now at 3c. base, as against 3.15c. recently.

Early shipments of nuts, bolts and rivets can be had at prices substantially below those announced some time ago for fourth quarter.

For the two ore boats the Ford Motor Co. has ordered 10,000 tons of plates and shapes, which will probably be placed with the leading producer.

Some curtailment of production by foundries having Ford Motor Co. contracts has been ordered. The company has parts on hand nearly equal to its requirements in the next three months and is taking a first step in the reduction of inventory.

On primary materials the market still tends downward. Furnace coke has sold at \$4 at oven, a decline of 25 cents in the week, and scrap prices are off 50c. to \$1.

In the Central West weakness in semi-finished steel is still indicated, delivery prices of \$42 on billets and sheet bars being quoted to Cleveland buyers.

Pig iron prices continue to decline. Lake Superior charcoal is \$2 lower. The Southern market is very weak, and although \$21 is still the ruling price, \$20 has been quoted. In eastern Pennsylvania and Buffalo, foundry grades have declined \$1, and furnaces have yielded at Pittsburgh, Chicago and Cleveland. The largest sales were of 5000 tons of basic at St. Louis and 7000 tons of foundry grades at Pittsburgh.

Finished steel remains at 2.775c. per lb. for the eleventh successive week, according to THE IRON AGE composite price. One year ago it was 2.474c. per lb.—the highest figure of 1922.

THE IRON AGE pig iron composite price has fallen to \$23.96, compared with \$24.38 last week. It is now lower than at any time since July of 1922.

Pittsburgh

Strong Demand for Pipe—Pig Iron Prices Lower—Export Orders for Tin Plate

PITTSBURGH, Oct. 2.—The final quarter of the year starts with no decided betterment in the steel business over that of the quarter just ended. With talk of price concessions becoming more distinct, buyers show no inclination to abandon a policy of committing themselves strictly in keeping with their known requirements, this tendency being heightened by a desire to keep inventories well in hand as the year draws to a close.

The bright spots in the situation as far as demand is concerned are standard pipe, for which there is no let up on the part of distributors in their pressure upon the mills and tin plate, which is being specified freely for delivery over the remainder of this year, and in which the large consumers are manifesting keen interest in regard to their early 1924 supplies. Some fair sized export orders for tin plate for China and Japan lately

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics

At date, one week, one month, and one year previous

For Early Delivery

Pig Iron, Per Gross Ton:	1923 Oct. 2,	1923 Sept. 25,	1923 Sept. 4,	1922 Oct. 3,
No. 2X, Philadelphia...	\$24.76	\$25.76	\$26.76	\$33.14
No. 2, Valley furnace...	24.50	24.50	24.50	33.00
No. 2, Southern, Cin'ti...	25.05	25.05	27.55	31.05
No. 2, Birmingham, Ala...	21.00	21.00	23.50	27.00
No. 2 foundry, Chicago...	26.00	26.00	27.00	32.00
Basic, del'd, eastern Pa...	25.00	25.00	25.00	29.50
Basic, Valley furnace...	24.00	24.50	25.00	33.50
Valley Bessemer, del. P'gh.	27.26	28.26	28.26	35.77
Malleable, Chicago...	26.00	26.00	27.00	32.00
Malleable, Valley...	24.50	24.50	24.50	33.50
Gray forge, Pittsburgh...	25.76	25.76	25.76	34.27
L. S. charcoal, Chicago...	30.04	32.15	32.15	36.15
Ferromanganese, furnace...	110.00	110.00	112.50	67.50

Rails, Billets, Etc., Per Gross Ton:	1923 Oct. 2,	1923 Sept. 25,	1923 Sept. 4,	1922 Oct. 3,
O.-h. rails, heavy, at mill...	\$43.00	\$43.00	\$43.00	\$43.00
Bess. billets, Pittsburgh...	40.00	40.00	42.50	40.00
O.-h. billets, Pittsburgh...	40.00	40.00	42.50	40.00
O.-h. sheet bars, P'gh...	42.50	42.50	42.50	40.00
Forging billets, base, P'gh.	47.50	47.50	47.50	45.00
O.-h. billets, Phila...	45.17	47.67	47.67	45.17
Wire rods, Pittsburgh...	51.00	51.00	51.00	45.00
Skelp, gr. steel, P'gh, lb...	2.40	2.40	2.40	2.00
Light rails at mill...	2.15	2.15	2.15	2.25

Finished Iron and Steel,	Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Iron bars, Philadelphia...	2.67	2.67	2.67	2.475	
Iron bars, Chicago...	2.35	2.35	2.40	2.50	
Steel bars, Pittsburgh...	2.40	2.40	2.40	2.00	
Steel bars, Chicago...	2.50	2.50	2.50	2.10	
Steel bars, New York...	2.74	2.74	2.74	2.44	
Tank plates, Pittsburgh...	2.50	2.50	2.50	2.25	
Tank plates, Chicago...	2.60	2.60	2.60	2.30	
Tank plates, New York...	2.84	2.84	2.84	2.49	
Beams, Pittsburgh...	2.50	2.50	2.50	2.00	
Beams, Chicago...	2.60	2.60	2.60	2.20	
Beams, New York...	2.84	2.84	2.84	2.44	
Steel hoops, Pittsburgh...	3.00	3.15	3.15	2.90	

*The average switching charge for delivery to foundries in the Chicago district is 61c. per ton.
†Silicon, 1.75 to 2.25. ‡Silicon, 2.25 to 2.75.

The prices in the above table are for domestic delivery and do not necessarily apply to export business.

Composite Price Oct. 2, 1923, Finished Steel, 2.775c. Per Lb.

Based on prices of steel bars, beams, tank plates, plain wire, open-hearth rails, black pipe and black sheets	These products constitute 88 per cent of the United States output of finished steel	Sept. 25, 1923, 2.775c. Sept. 4, 1923, 2.775c. Oct. 3, 1922, 2.474c. 10-year pre-war average, 1.689c.
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Composite Price Oct. 2, 1923, Pig Iron, \$23.96 Per Gross Ton

Based on average of basic and foundry irons, the basic being Valley quotation, the foundry an average of Chicago, Philadelphia and Birmingham	Sept. 25, 1923, \$24.38 Sept. 4, 1923, 26.38 Oct. 3, 1922, 32.11 10-year pre-war average, 15.72
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have been taken at the full domestic price of \$5.50 base box. That this business should come to this country at that price is taken to mean a stronger situation across the water and encourages hopes of increased export business.

The major products, plates, shapes and bars, are the slow movers. As to prices, the most important change of the week has been a drop of \$3 a ton in hoops, bands and hot-rolled strips. These products now are at 3c. base, as against 3.15c. set up as the fourth quarter price. The weakness in this line finds its explanation in the fact that demand is below normal and a competitive condition has been created because some mills in their desire to maintain relatively full operation have gone pretty low to secure orders. On wide strips 3c. is a maximum rather than a minimum price. Early shipments of bolts, nuts and rivets can be had at substantially lower prices than manufacturers have announced as fourth quarter quotations. Recent quotations hold on all other products, on plates, shapes and bars because independent makers fear they would have to compete with the present invoice price of the Steel Corporation, which on these products is said to be \$6 to \$10 a ton below current quotations. Strict adherence to quotations by independent companies, however, is re-

Sheets, Nails and Wire,	1923 Oct. 2,	1923 Sept. 25,	1923 Sept. 4,	1922 Oct. 3,
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Sheets, black, No. 28, P'gh.	3.75	3.75	3.75	3.50
Sheets, galv., No. 28, P'gh.	5.00	5.00	5.00	4.50
Sheets, blue an'd, 9 & 10	3.00	3.00	3.00	2.60
Wire nails, Pittsburgh...	3.00	3.00	3.00	2.70
Plain wire, Pittsburgh...	2.75	2.75	2.75	2.45
Barbed wire, galv., P'gh.	3.80	3.80	3.80	3.35
Tin plate, 100-lb. box, P'gh.	\$5.50	\$5.50	\$5.50	\$4.75

Old Material, Per Gross Ton:

Carwheels, Chicago...	\$19.00	\$19.50	\$20.00	\$24.50
Carwheels, Philadelphia...	20.50	21.00	21.00	23.00
Heavy steel scrap, P'gh...	16.50	17.50	18.00	22.00
Heavy steel scrap, Phila...	16.00	16.50	17.00	18.50
Heavy steel scrap, Ch'go...	15.00	16.00	16.50	18.50
No. 1 cast, Pittsburgh...	21.00	21.00	22.00	24.00
No. 1 cast, Philadelphia...	20.50	21.00	21.50	23.00
No. 1 cast, Ch'go (net ton)	19.00	19.50	19.50	21.00
No. 1 RR. wrot. Phila...	19.00	19.00	18.00	23.00
No. 1 RR. wrot. Ch'go (net)	14.50	15.00	16.00	18.25

Coke, Connellsville,

Per Net Ton at Oven:	1923 Oct. 2,	1923 Sept. 25,	1923 Sept. 4,	1922 Oct. 3,
Furnace coke, prompt...	\$4.00	\$4.25	\$5.00	\$12.00
Foundry coke, prompt...	5.00	5.00	6.00	13.00

Metals,

Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Lake copper, New York...	13.75	13.87½	14.00	14.25
Electrolytic copper, refinery	13.00	13.25	13.50	13.75
Zinc, St. Louis...	6.30	6.42½	6.50	6.80
Zinc, New York...	6.65	6.77½	6.85	7.15
Lead, St. Louis...	6.70	6.75	6.70	6.30
Lead, New York...	7.00	7.10	7.00	6.65
Tin (Straits), New York...	41.87½	42.25	41.50	32.87½
Antimony (Asiatic), N. Y.	7.50	7.50	7.50	6.75

sulting in some intermittency in rolling mill operations.

The market still is headed downward on the primary materials. Furnace coke has sold down to \$4 per net ton at ovens, a decline of 25c. a ton since a week ago. Basic iron has dropped 50c. a ton to \$25 at Valley furnace and Bessemer \$1 a ton to \$25.50 after having stood at \$26.50 since early July. Further declines of 50c. to \$1 a ton have taken place in scrap iron and steel.

Pig Iron.—The Westinghouse Electric & Mfg. Co. since a week ago has closed on about 7000 tons of foundry iron for its local and Cleveland foundries and was able to purchase this iron at the lowest prices of the year to date. The bulk of the 3000 tons for Cleveland went to a Cleveland furnace at \$25.50 delivered, and this price also was made by a Buffalo producer on a part of the tonnage. For its Trafford, Pa., works the bulk of the foundry iron was secured at a delivered price of \$25.89 for No. 2, this from western Pennsylvania furnaces, while iron bought from Valley furnaces sold at \$24 for No. 3 grade and a small lot of No. 2X brought \$25.50. The National Malleable Casting Co. bought 1000 tons of basic at \$24.50 delivered Sharon, Pa.; or \$24 at Valley furnace. While small sales of Bessemer have been made at \$26 Valley furnace since a week ago, there was one sale of 250 tons to a local melter at \$25.50,

Valley furnace. These were the only important sales of the week. Buyers generally cling to the idea that large stocks, which are piled up on local furnace yards, will prevent any immediate stiffening of prices and they are governing their purchases accordingly. W. P. Snyder & Co. make the average price of basic iron from Valley furnaces for September \$24.50, against \$25 in August, and on Bessemer \$26.50, the same price as in August.

We quote Valley furnace, the freight rate for delivery to the Cleveland or Pittsburgh district being \$1.76 per gross ton:

Basic	\$24.00
Bessemer	\$25.50 to 26.00
Gray forge	24.00
No. 2 foundry	24.50
No. 3 foundry	24.00
Malleable	24.50
Low phosphorus, copper free....	30.00

Ferroalloys.—Activity is lacking locally in all of the ferroalloys and prices are easy, although in the case of ferromanganese the claim is made that practically all of the resale British material has been cleaned up and that this development justifies a firmer stand as to prices. Agents of British producers have been advised that the price still is \$117.50 c.i.f. Atlantic seaboard duty paid, but business at that figure is out of the question at the moment, since the resale tonnages filled up those short of supplies and American producers have not yet withdrawn their quotation of \$110, furnace or seaboard. Spiegeleisen is dull and weak and available at \$43, furnace, for average 20 per cent material. Hardly enough is going on in 50 per cent ferrosilicon to determine real prices, but the market is not quotable above \$82.50 delivered, and it is believed that \$80 can be done. Prices are given on page 937.

Semi-Finished Steel.—A Warren, Ohio, steel company is making frequent appearances in the market for tin bars and usually seeks delivery within a week. This interest has been paying \$42.50, Youngstown, and locally the claim is made that \$41 is as low as any recent business has been done in sheet bars. The market for billets and slabs is slow and weak, and while there have been a few sales of small tonnages recently as high as \$42.50, a much greater amount of business has been done at or near \$40. Demand for sheets is very light and the possibility of lower prices keeps down the demand and specifications for sheet bars. Considerable price cutting is going on in hoops, bands and strips and this is not without effect upon the billet and slab market. Forging billets still are quoted at \$47.50, base, but no large tonnages are moving at that figure, and it is reported that those making forgings for the automotive industry are exerting considerable pressure for a downward revision of price. Skelp still holds at 2.40c., but that price is largely untested. Wire rods are slow of sale and prices are slightly easier to the extent that the extra for coarse rods is being waived by some makers. Prices are given on page 937.

Wire Products.—A good demand is observed for plain wire from manufacturers, but there is not much activity in other products. Jobbers are carrying fair sized stocks and, having an idea that prices will be lower before they are higher, they are disposed to make fresh commitments with considerable caution. A fair volume of orders is coming to local mills, but most of the business is for prompt delivery and does not help to create backlogs, since the mills are well caught up with old obligations and in a position to take care of current orders. There is close adherence to quoted prices by local mills. Prices are given on page 936.

Steel Rails.—The ordinary quotation on light rails rolled from billets is 2.25c., base, but the market is not firm at that level and would be shaded on attractive orders. On such business 2.15c., base, or less could be done and an absence of sales at less than 2.25c., base, in the past week is explained by the lack of inquiries of an attractive character. Light sections rolled from old standard rails still are to be had at from 1.90c. to 2c., base.

We quote light rails rolled from new steel at 2.15c. to 2.25c. base (25-lb. to 45-lb.); those rolled from old rails, 1.90c. to 2c. base (12-lb. to 45-lb.), f.o.b. mill; standard rails, \$43 per gross ton mill, for Bessemer and open-hearth sections.

Tubular Goods.—Pressure for shipments of stand-

ard pipe still is heavy, as it has been throughout the year, but activity in oil country goods still is on a tapering scale, although reports of a decreased production of crude oil encourage expectations of an improved demand before the end of the year. New business in boiler tubes is slow and there is some irregularity in prices, notably in seamless tubes. Discounts

Cold-finished Steel Bars and Shafting.—Local mills still are holding to 3.25c., base, although the demand is comparatively light. Consumers are drawing upon their stocks of lower-priced material and are making fresh purchases with considerable caution in the belief that prices are not going to be any higher in the near future, and in view of persistent reports of a weaker market in hot-rolled bars that the price of cold-finished bars may actually decline. The extra for hot-rolled bars of cold-finishing analysis adopted by leading manufacturers as of July 1 has not yet become generally effective because the manufacturers had so much business upon their books before the change was announced. It is believed, however, that such tonnage as escaped the extra will have been largely shipped in the next few weeks. Ground shafting still is quoted at 3.65c., base, f.o.b. mill for carload lots.

Hot-Rolled Flats.—This line of products seems to have pretty generally settled to 3c., base, Pittsburgh, as a maximum, although the former quotation of 3.15c. has not entirely disappeared. Business at the latter figure has been difficult, however, as so many mills have considered the assurance of full mill operations of first importance and have not hesitated to cut prices to maintain schedules. On wide strips well below 3c., base, has been done, although makers here deny having gone as low as 2.75c., reported in other centers. Strip makers are having pretty stout competition from plates or skelp and from manufacturers who have jobbing mills, at present none too well supplied with orders for regular jobbing mill products. Prices are given on page 936.

Structural Material.—Weaker advices from other markets have found no response locally, although independent mills are exhausting their backlogs and curtailed mill operations are in prospect, since fresh inquiries run chiefly to small tonnages and are not especially numerous. Prices are given on page 936.

Plates.—The leading interest still has a comfortable backlog but is producing and shipping at a rate that suggests its early ability to take on new business. Independent mills are not as well off and are making very prompt delivery of the small tonnages now being sought. There has been a considerable falling off in the demand for oil storage tanks now that the production of crude oil has begun to show some decrease. There is no shading of the regular market price of 2.50c. base, but inquiries of a size that might induce concessions are lacking. Prices given on page 936.

Bolts, Nuts and Rivets.—There seem to be two distinct markets in these products. Makers generally appear to lack prompt shipment orders and are going pretty low to get them. The effort is being made to hold bolts at 60 and 5 per cent off list for large machine bolts for fourth quarter contracts, but for spot delivery the common price is 60 and 10 per cent off list. Lower prices also are obtainable on nuts for prompt shipment than on fourth quarter contracts, and in rivets at least one order recently was placed as low as \$2.75 base, and \$2.85 is a fairly common quotation on desirable orders, as against \$3 named by large producers for fourth quarter. The quotable range on large rivets is from \$2.75 to \$3. The decline in rivet prices is much less than is indicated, however, owing to increases in the extras, which mean actual prices well up to those obtained on the higher base and lower extras. Prices are given on page 936.

Cold-Rolled Strips.—There is fairly close adherence to 5c., base, Pittsburgh, on this product, although demand is light by comparison with that of the fore part of the year. Buyers are placing orders rather than contracts as a general rule, a tendency which reflects some lack of confidence in the maintenance of the present price.

Iron and Steel Bars.—All makers of steel bars here still claim to be adhering firmly to 2.40c. base, and the tendency among independent mills is to curtail production rather than cut that price. We also note close adherence to quotations on iron bars.

We quote soft steel bars, rolled from billets, at 2.40c. base; bars for cold-finishing of screw stock analysis, \$3 per ton over base; reinforcing bars, rolled from billets, 2.40c. base; refined iron bars, 3.25c. base, in carload lots or more, f.o.b. Pittsburgh.

Sheets.—While business in sheets shows some improvement with most makers, it would be exaggeration to call the market active. It is intimated that the next report of the National Association of Sheet and Tinplate Manufacturers will show that September orders were practically double those of August. The American Sheet & Tinplate Co. has bookings which it is estimated will take it through November at the present rate of operation, about 80 per cent of capacity. Concessions from regular quotations have appeared in practically all finishes except possibly automobile body stock. Prices are given on page 936.

Track Fasteners.—Weakness of small spikes in the East seems to be spreading, as a delivered price of \$3.25, base 100 lb., has appeared here. As high as \$3.50 still is quoted and sales are claimed at that price, but apparently on rather small lots. Track bolts and tie-plates are steady as to price, but show only moderate activity. Prices are given on page 936.

Tin Plate.—Large container manufacturers are already making known probable requirements for the first half of 1924 and the leading interest already considers that the bulk of its production for that period is engaged. Nothing yet has been said as to prices for the first and second quarters of the new year, but the common impression is that the present prices will be continued, this idea finding support in the fact that some fair sized export orders recently were taken at the full domestic quotation of \$5.50.

Old Material.—Only an appraisal of prices is possible this week, since there is practically no demand from the steel manufacturers and the dullness is only slightly less intense as far as the foundries and consumers of specialties are concerned. The undertone of the market is decidedly soft, because dealers are not anxious to take on material for which they see no outlet except their own yards and prices are not yet down to a level where purchases for yard are considered safe. Much material is pressed for sale and dealers report having bought heavy melting steel as low as \$16. Steel mills, being out of the market, have declined offers of this grade at \$17. It is claimed by dealers that they also have been able to buy compressed sheets as low as \$14, delivered, but this is believed to be an exceptional case and is hardly representative of the market. Local mills which have been buying turnings and borings have covered their present requirements and have materially lowered their bids. Prices show further declines as compared with last week or from 50c. to \$1 a ton and on a number of grades are the lowest of the year.

We quote for delivery to consumers' mill in the Pittsburgh and other districts taking the Pittsburgh freight rate as follows:

Per Gross Ton	
Heavy melting steel.....	\$16.50 to \$17.00
No. 1 cast, cupola size.....	21.00 to 21.50
Rails for rolling, Newark and Cambridge, Ohio; Cumberland, Md.; Huntington, W. Va., and Franklin, Pa.....	18.00 to 18.50
Compressed sheet steel.....	14.50 to 15.00
Bundled sheets, sides and ends..	13.50 to 14.00
Railroad knuckles and couplers..	21.00 to 21.50
Railroad coil and leaf springs...	21.00 to 21.50
Low phosphorus bloom and billet ends	24.00 to 24.50
Low phosphorus plate and other material	23.00 to 23.50
Railroad malleable	20.50 to 21.00
Steel car axles	20.00 to 20.50
Cast iron wheels	18.00 to 18.50
Rolled steel wheels	21.00 to 21.50
Machine shop turnings	13.00 to 13.50
Sheet bar crops.....	18.50 to 19.00
Heavy steel axle turnings.....	15.00 to 15.50
Short shoveling turnings.....	14.00 to 14.50
Heavy breakable cast	18.50 to 19.00
Stove plate	15.00 to 15.50
Cast iron borings	15.00 to 15.50
No. 1 railroad wrought.....	13.50 to 14.00
No. 2 railroad wrought.....	16.50 to 17.00

Coke and Coal.—The market continues dull and almost entirely in buyers' favor. This is particularly the case on coal, offerings of which still greatly exceed the demand. Spot furnace coke is down to \$4 per net ton at ovens on sales and higher figures now are simply asking prices. There is no contract business whatever in furnace coke; the asking prices on such tonnages range from \$4.50 to \$4.75, but the best brands probably could be bought at the lower figure and less desirable ones at \$4.25. Spot foundry coke still is quotable from \$5 to \$5.50. Slack steam coal has sold as low as 90c. a ton, mines, and gas slack is available at from \$1.25 to \$1.35. We quote mine run steam coal at \$1.85 to \$2.10, mine run coking coal at \$2 and gas grade at \$2.25.

BRITISH MARKET FIRM

Pig Iron Market Improved—Buying by Japan Heavy—Mass Production

LONDON, ENGLAND, Sept. 20.—There has been a slightly improved tone during the past week or so which is in part attributable to the sudden rush of orders from the Far East. Pig iron consumers at home and abroad are evidently beginning to feel that prices are about as low as they are likely to go as long as costs remain where they are and in consequence there has been more disposition to enter into forward commitments and demand has been spread over the end of the year requirements. Inquiry from the continent has also improved, but stocks of pig iron are still fairly substantial. No. 3 Cleveland is at about 97s., while for East Coast mixed numbers hematite makers ask from 99s. to 100s.

It was thought at one time that the Japanese requirements would be on a very heavy scale as a result of the earthquake, but so far there has been no extraordinary demand from that quarter except for galvanized sheets, galvanized wire, and wire nails of which large quantities have been bought for immediate reconstructional requirements, but there is as yet little sign of important structural material orders coming to hand, though it is reported that several lines have been placed with continental producers.

The weakest part of the iron and steel trades is undoubtedly the abstention from buying from India and until this market comes in to place its normal requirements little revival can be looked for. New ship-building is at a very low rate, but there is considerable activity at the railroad material plants.

It is interesting to note that mass production is being adopted by the London, Midland & Scottish Railway at their Derby car building works, and, whereas it used to take from six weeks to complete a car, one can now be assembled in six days. It is rather early to judge what effect the new processes will have upon the car building trades, but Mr. Nicholson, general secretary of the Vehicle Builders' Union, remarked that "there is no doubt that mass production in some form or other is now essential in railway carriage construction."

An interesting news item is the statement that a large iron and steel merchant company has recently purchased from the Admiralty a huge steel floating dock for testing submarines which was constructed for the German Navy and taken over by the British Admiralty at the end of the war. This dock weighs 5000 tons, and has a total length of 412 ft. and a breadth of 131 ft., and the main feature of its construction is a large cylinder for the reception of the submarine for testing purposes. It was designed by an engineer in Hamburg and the plans were rejected by the Russian Government, to whom they were first submitted, but in 1917 were accepted by the German Government. The construction, however, was delayed and was not completed before 1918. The merchant company has bought the dock for breaking up purposes and are taking it to their depot at Queenborough where they are now engaged in breaking up two dreadnoughts.

Chicago

Favorable Signs Not Entirely Absent in a Quiet Market

CHICAGO, Oct. 2.—The market is quiet in all departments with buyers still pursuing a waiting policy. Pig iron and scrap are notably weak, and while the heavier forms of finished steel products still are steady, consumers are placing orders cautiously. But signs of improvement are not entirely lacking. An important local independent reports that bookings are now equal to shipments, although this is not yet true of other producers. The Chicago district office of another important mill booked 100 per cent more business in September than in August. Much of the tonnage taken was rails, the remainder consisting largely of plates, shapes and bars. Nothing resembling a real buying movement, however, has developed, and in view of the satisfactory deliveries now available, it is probable that users will continue to limit their orders to early requirements. Mills are encouraged by sustained consumption among industrial plants, some of which are operating at close to 100 per cent. On the other hand, some industries are fast approaching the time when they will be forced to curtail, if they have not already done so. The operating schedules of a number of automobile manufacturers are now being reduced, and in view of the lack of new orders for railroad cars, carbuilders will soon reach the end of their present bookings. Fabricators in this district, however, have enough structural business to keep them occupied until well toward the end of the year.

Blast furnace and mill operations of the two leading local steel interests remain substantially unchanged.

Pig Iron.—The market is quiet and prices are soft. Charcoal has declined \$2 to \$27, base furnace. Southern foundry is notably weak with \$21, Birmingham, the common quotation, and 50c. less than that reported in connection with recent sales in Michigan. In fact, as low as \$20, Birmingham, has been quoted in a few instances, although no orders at that price have been reported in this district. The recent arrival of two boatloads of Buffalo iron, previously noted in this column, has further stimulated competition in the sale of Northern foundry. Local producers now contemplate the shipment of an equivalent tonnage into the Buffalo market. Sales of Northern iron in this territory during the week have been few and so far as can be ascertained have brought the full market of \$26, base furnace. In sections intermediate between producing centers, that price has been shaded as much as \$1 a ton to meet the competition of outside furnaces. Two Indiana melters are understood to have bought 500 tons of malleable and 200 tons of foundry at \$25 base, Chicago. A melter in the St. Louis metropolitan district has purchased 5000 tons of basic from a Chicago seller. A Wisconsin plant is inquiring for 1000 tons of foundry for delivery over the current quarter. Another Wisconsin melter has closed for 200 tons each of Northern and Southern foundry. A local buyer is in the market for 300 tons of low phosphorus. A Michigan melter has purchased 100 tons of 8 per cent silvery at the Jackson County schedule. While melters' stocks are low, their failure to buy for other than immediate needs is not due entirely to a desire to drive prices down. On the contrary, the spirit of caution has extended to the melters' customers with the result that the forward commitments on the books of foundries are too small to justify an intelligent estimate of their iron requirements for any distance ahead. They purchase iron as they find it necessary to take care of new business as it comes in, and the surprising feature of the entire situation is that foundry operations are so well maintained. In some directions, notably in the automotive industry, there has been some curtailment, but this is regarded as seasonal, inasmuch as automobile output generally declines in the fall. September bookings of Northern furnaces were approximately equal to those of August. Stocks on fur-

nace yards are still large and it is probable that another merchant furnace will be banked or blown out in the near future.

Quotations on Northern foundry high phosphorus malleable and basic irons are f.o.b. local furnace and do not include an average switching charge of 61c. per ton. Other prices are for iron delivered at consumer's yard or when so indicated, f.o.b. furnace other than local.

Lake Superior charcoal, averaging	
sil. 1.50, delivered at Chicago..	\$30.04 to \$30.15
Northern coke, No. 1, sil. 2.25 to	
2.75	26.50
Northern coke, foundry, No. 2, sil.	
1.75 to 2.25.....	26.00
Malleable, not over 2.25 sil.....	26.00
Basic	26.00
High phosphorus	26.00
Southern No. 2.....	27.01
Low phos., sil. 1 to 2 per cent,	
copper free	34.00
Silvery, sil. 8 per cent.....	39.29

Ferroalloys.—A local buyer has closed for 200 tons of 15 per cent ferrosilicon. Another Chicago melter has placed an order for 100 tons of 12 per cent electrolytic ferrosilicon. Recent sales of ferromanganese, largely resale lots, have been made at from \$102 up to \$110, seaboard. Producers' prices are said to have stiffened at \$110 with the possibility of an advance to the former figure of \$117.50, seaboard. Prospective orders here include one lot of 400 or 500 tons. Spiegeleisen has declined to \$40, furnace, or \$45.80, delivered.

We quote 80 per cent ferromanganese, \$116.56 to \$117.38, delivered; 50 per cent ferrosilicon, \$85 to \$87, delivered; spiegeleisen, 18 to 22 per cent, \$45.80, delivered.

Plates.—In the absence of railroad car buying and oil tank business, the plate market is quiet. Present efforts of oil producers to effect a general curtailment of pumping and drilling operations are expected to fail, in which case the purchase of much additional storage capacity will become imperative. Prices are firm at 2.60c. Chicago.

The mill quotation is 2.60c., Chicago. Jobbers quote 3.30c. for plates out of stock.

Cast Iron Pipe.—In view of the steady decline of pig iron, lower pipe prices would not be surprising. Current quotations show on increasing trend toward softness, particularly on business for extended delivery, and general reductions are believed inevitable. It is improbable, however, that there will be any radical drop from the present market level, as the bookings of pipe makers are still fairly comfortable, notably in the smaller diameters. The United States Cast Iron Pipe & Foundry Co. has booked 3000 tons of 48-in. for Omaha, Neb.; 860 tons for Chicago, and 300 tons for Berne, Ind. James B. Clow & Sons have been awarded 500 tons by Orrville, Ohio, and 250 tons by Port Huron, Mich. Detroit took bids yesterday on 500 tons of 12-in. Whitecloud, Mich., takes figures Oct. 4 on approximately 100 tons of 4-, 6- and 8-in. Lake County, Ohio, which received revised figures on 1200 tons Sept. 28, is expected to place the business by next Monday.

We quote per net ton, f.o.b. Chicago, as follows: Water pipe, 4-in., \$63.20; 6-in. to 12-in., \$59.20; above 12-in., \$57.20; class A and gas pipe, \$5 extra.

Sheets.—Actual orders from Japan have failed to materialize as yet, but some manufacturers are confident that when business does come from that country it will employ from 20 to 30 per cent of American mill capacity for several months. In the meantime the market has a softer tendency. A number of the smaller mills continue to quote 3.75c. base, Pittsburgh, for black, and sporadic quotations on galvanized at as low as 4.90c. and 4.85c., base, Pittsburgh, are reported. Apparently a comparatively small amount of new tonnage is being booked at any price.

Mill quotations are 3.75c. to 3.85c. for No. 28 black, 3c. for No. 10 blue annealed and 5c. for No. 28 galvanized, all being Pittsburgh prices, subject to a freight rate to Chicago of 34c. per 100 lb.

Jobbers quote, f.o.b. Chicago, 4.35c. for blue annealed, 5.20c. for black and 6.35c. for galvanized.

Belts and Nuts.—With buying slow and competition for business keen, the market is soft. Generally speaking, the lower prices shown on page 936, figured on an f.o.b. Chicago basis, represent what is being done to

obtain particularly attractive orders, while the higher prices are the more common quotations. In extreme instances sellers have increased their discounts sufficiently to compensate for the higher list prices recently put into effect.

Jobbers quote structural rivets, 4c.; boiler rivets, 4.20c.; machine bolts up to $\frac{3}{4}$ x 4 in., 45 and 5 per cent off; larger sizes, 45 and 5 off; carriage bolts up to $\frac{3}{4}$ x 6 in., 40 and 5 off; larger sizes, 40 and 5 off; hot pressed nuts, squares and hexagons, tapped, \$2.50 off; blank nuts, \$2.50 off; coach or lag screws, gimlet points, square heads, 50 and 5 per cent off.

Rails and Track Supplies.—The Chesapeake & Ohio has equally divided 17,000 tons of standard section rails between the two local mills and is understood to have placed 13,000 tons additional with mills east of here. The Hocking Valley has ordered 5400 tons of rails from Carnegie Steel Co. Chicago mill bookings for the first half of 1924 are now estimated at over 250,000 tons, and it is believed that a considerable quantity of rails for that delivery is still to be bought. The Missouri Pacific is expected to buy 30,000 tons and other roads which will probably also take action include the Chicago & Northwestern, the Santa Fé, the Rock Island, the Nickel Plate, the Missouri, Kansas & Texas, the Cotton Belt and the Pennsylvania. Demand for light rails is slightly better with local prices unchanged.

Standard Bessemer and open-hearth rails, \$43; light rails, rolled steel, 2.25c. f.o.b. makers' mills.

Standard railroad spikes, 3.25c. mill; track bolts with square nuts, 4.25c. mill; iron tie plates, 2.85c. mill; steel tie plates, 2.60c., f.o.b. mill; angle bars, 2.75c., f.o.b. mill.

Jobbers quote standard spikes out of warehouse at 3.90c. base and track bolts, 4.90c. base.

Structural Material.—Notwithstanding the recent decline in lettings, fabricators in this district have satisfactory bookings, some of the larger companies being committed until the end of the year. Buying of plain material shows some improvement, although most individual orders are small. Among new fabricating projects a bridge program authorized by the Legislature of South Dakota is of interest. This provides for five bridges across the Missouri River between the northern and southern boundaries of the State. For two of them, namely, one at Wheeler and one at Moberg, involving a total of 2100 tons, appropriations have already been set aside. Plain material remains steady at 2.60c. Chicago.

The mill quotation on plain material is 2.60c. Chicago. Jobbers quote 3.30c. for plain material out of warehouse.

Wire Products.—New business still falls short of mill shipments, reflecting the conservative attitude of both jobbers and retailers. Jobbers are buying enough to replenish their stocks as they are depleted, but not much beyond that. Actual consumption shows little recession, but mill bookings for the time being are affected by the hesitant attitude of buyers. For mill prices, which are steady and unchanged, see finished iron and steel, f.o.b. Pittsburgh, page 936.

We quote warehouse prices f.o.b. Chicago: No. 6 to No. 9 bright basic wire, \$3.90 per 100 lb.; extra for black annealed wire, 15c. per 100 lb.; common wire nails, \$3.80 per 100 lb.; cement coated nails, \$3.25 per keg.

Reinforcing Bars.—Prices have been rather erratic since the market broke from 3c., Chicago warehouse, but the ruling price level now appears to be settling at 2.75c. Competition is still keen, however, and it is possible that a large tonnage of desirable specifications might still be placed at a lower figure. Recent lettings include:

Freight house for Chicago, Burlington & Quincy Railroad, 900 tons to Kalman Steel Co.

Olympia Fields Country Club club house near Chicago, 200 tons to Kalman Steel Co.

High school, Mishawaka, Ind., 170 tons to Concrete Steel Co.

Illinois highway work, 150 tons to Concrete Steel Co.

Middle West Utilities Co. power house, Tulsa, Okla., 100 tons to Joseph T. Ryerson & Son.

Department store, Pullman, Ill., 100 tons to Concrete Steel Co.

Chicago, Rock Island & Pacific Railroad, 100 tons for work at Harrington, Kan., to Corrugated Bar Co.

Pending work includes:

Superstructure for Milwaukee Journal building, Milwaukee, 500 tons.

Illinois State Journal Building, Springfield, Ill., 210 tons, bids on general contract taken Oct. 1.

Bars.—Bookings in soft steel bars show some gain, although still unequal to mill shipments. Local mill prices remain steady at 2.50c. Chicago, but it is notable that a few sales of deformed bars from warehouse have recently been made at mill quotations. Bar iron prices remain unchanged, but soft, with new business light. The bar iron mill of the Interstate Iron & Steel Co. at East Chicago, which has been idle, will resume operations the middle of this week. Rail steel bars are steady at 2.30c., but demand is inactive. The Moline hard steel mill of the Republic Iron & Steel Co., which has been down for several weeks, is expected to resume the middle of this week or the beginning of next.

Mill prices are: Mild steel bars, 2.50c., Chicago; common bar iron, 2.35c. to 2.40c., Chicago; rail steel, 2.30c., Chicago mill.

Jobbers quote 3.20c. for steel bars out of warehouse. The warehouse quotation on cold-rolled steel bars and shafting is 4.55c. for rounds and 5.05c. for flats, squares and hexagons.

Jobbers quote hard and medium deformed steel bars at 2.75c. base; hoops, 4.55c.; bands, 3.95c.

Old Material.—The market is exceedingly weak and the only question in doubt is the extent to which prices have declined below last week's level. Consumers show little interest and even brokers are cautious about buying. The last mill purchase of heavy melting was at \$16, but the best price offered by a user today is \$15.50. A few moderate sales of stove plate to melters has been made. Railroad offerings are large. The Chicago & Northwestern has advertised 8000 tons; the Burlington, 5000 tons; the Pennsylvania, Southwestern Region, 7500 tons; the Pennsylvania, Northwestern Region, 2600 tons; and the Michigan Central and the New York Central, blind lists. Through typographical errors steel rails less than three feet and machine shop turnings were incorrectly quoted in the issue of Sept. 27. Short rails should have been quoted at \$20 to \$20.50 per gross ton and machine shop turnings at \$8.50 to \$9 per net ton.

We quote delivery in consumers' yards, Chicago and vicinity, all freight and transfer charges paid, as follows:

Per Gross Ton

Iron rails	\$20.50 to \$21.00
Cast iron car wheels	19.00 to 19.50
Relaying rails, 56 and 60 lb.	26.00 to 27.00
Relaying rails, 65 lb. and heavier	32.00 to 35.00
Rolled or forged steel car wheels	20.00 to 20.50
Rails for rolling	17.00 to 17.50
Steel rails, less than 3 ft.	19.00 to 19.50
Heavy melting steel	15.00 to 15.50
Frogs, switches and guards cut apart	15.25 to 15.75
Shoveling steel	14.75 to 15.25
Drop forge flashings	11.00 to 11.50
Hydraulic compressed sheets	12.50 to 13.00
Axle turnings	12.00 to 12.50
Steel angle bars	17.00 to 17.50

Per Net Ton

Iron angle and splice bars	20.50 to 21.00
Iron arch bars and transoms	20.50 to 21.00
Iron car axles	25.00 to 25.50
Steel car axles	17.50 to 18.00
No. 1 busheling	12.00 to 12.50
No. 2 busheling	8.50 to 9.00
Cut forge	14.00 to 14.50
Pipes and flues	8.50 to 9.00
No. 1 railroad wrought	14.50 to 15.00
No. 2 railroad wrought	14.00 to 14.50
Steel knuckles and couplers	18.50 to 19.00
Coil springs	19.00 to 19.50
No. 1 machinery cast	19.00 to 19.50
No. 1 railroad cast	18.50 to 19.00
No. 1 agricultural cast	19.00 to 19.50
Low phosph. punchings	16.00 to 16.50
Locomotive tires, smooth	15.00 to 15.50
Machine shop turnings	8.00 to 8.50
Cast borings	10.00 to 10.50
Short shoveling turnings	10.00 to 10.50
Stove plate	16.50 to 17.00
Grate bars	14.00 to 15.00
Brake shoes	15.50 to 16.00
Railroad malleable	18.50 to 19.00
Agricultural malleable	17.50 to 18.00

New York

Pig Iron Prices Lower, with Limited Business Being Done

NEW YORK, Oct. 2.—Weakness continues in the pig iron market, prices having receded from 50c. to \$1 on nearly all grades. The low prices have developed only a fair amount of business. One agency sold about 5000 tons and several thousand tons were disposed of by other agencies. Sales included one transaction of 2500 tons concerning which details were not announced; 500 tons bought by the Gould Coupler Co.; 2000 tons by the New York Air Brake Co., and 900 tons by the General Electric Co. The last named company still being in the market for 250 of No. 1X and 350 tons of higher silicon iron. Michigan charcoal is down \$2 and is now quoted \$27 base, furnace. Buffalo furnaces have been very aggressive and \$23.50 is freely quoted on No. 2 plain and No. 2X, with usually 50c. more for No. 1. The eastern Pennsylvania market is unsettled with \$23.50 as probably the minimum for No. 2.

We quote delivered in the New York district as follows, having added to furnace prices \$2.27 freight from eastern Pennsylvania, \$4.91 from Buffalo and \$5.44 from Virginia:

East. Pa. No. 1X fdy., sil.	2.75 to 3.25	...	\$26.77
East. Pa. No. 2X fdy., sil.	2.25 to 2.75	...	26.27
East. Pa. No. 2, sil.	1.75 to 2.25	...	26.27
Buffalo, sil.	1.75 to 2.25	...	28.41
No. 2X Virginia, sil.	2.25 to 2.75	...	30.94
No. 2 Virginia, sil.	1.75 to 2.25	...	30.44

Ferroalloys.—The ferromanganese market is slightly more active with inquiries totaling about 1000 tons. There has been no change in the price of the alloy from British producers and there are indications that most of the alloy which has recently been available around \$110, seaboard basis, has been absorbed. Because of prices at which certain domestic producers are willing to take business the price situation has changed but little. Imports of the alloy during August were 6845 tons, bringing the total for the first eight months of this year to 64,894 tons, or over 8100 tons per month. Business in spiegeleisen is confined to carload and small lots at unchanged quotations. Manganese ore importations continue unprecedentedly low, the August receipts having been 23,026 tons, bringing the total for the first eight months to 127,238 tons, as compared with 280,668 tons for the same eight months last year. Unchanged quotations prevail in the 50 per cent ferrosilicon and the ferrochrome markets with demand very moderate.

Cast-Iron Pipe.—Demand for water pipe continues heavy, although the fact that on many sizes makers cannot offer delivery much before the end of the year is undoubtedly a deterrent to many purchasers. One foundry reports six to eight weeks delivery on medium specifications, but much longer shipment on the heavy and the small sizes. Prices continue firm and unchanged. No new municipal tenders are reported. We quote per net ton, f. o. b. New York, in carload lots, as follows: 6-in. and larger, \$63.60; 4-in. and 5-in., \$68.60; 3-in., \$78.60, with \$5 additional for Class A and gas pipe. As the end of the season approaches, the soil pipe market is slightly less active, although makers are still fairly well booked ahead. Most of the present shipments are reported as going forward at prices prevailing previous to the increase that brought quotations to their present level. We quote discounts of both Southern and Northern makers, f. o. b. New York, in carload lots, as follows: 6-in., 34½ to 35½ per cent off list; heavy, 44½ to 45½ per cent off list.

Finished Iron and Steel.—Most of the Eastern plate mills are now quoting 2.40c., Pittsburgh, on all inquiries except those for less than carloads. Pittsburgh and Youngstown makers of plates have not followed this reduction of \$2 a ton. Demand for plates, as for most other lines of steel except pipe, is extremely light. No other price weakness has appeared, however, except that which has existed for some weeks in structural shapes, offered by two or three mills at 2.40c., Pittsburgh, and in black sheets, which some of the smaller mills quote at 3.75c., Pittsburgh. While steel bars remain firm at 2.40c., bar iron is more freely available

at 2.35c., Pittsburgh. Structural steel work continues in fair volume in the metropolitan district, but many of the projects which were regarded a few weeks ago as likely to be closed promptly are being held up for one reason or another. Prospects for further important buying of oil tanks and freight cars this year do not appear bright, and it is these two lines that have sustained the plate mills to a large degree throughout the year. Car builders quite generally have enough work to carry them through the fourth quarter and are giving thought to the possibilities of 1924 buying of cars on an extensive scale. Four roads have been expected to come into the market with inquiries for a total of about 30,000 cars, but none of these inquiries has definitely developed and the buying may be deferred until later in the year.

Warehouse Business.—Warehouses with connections in other districts report that prices are generally firmer here than in some other cities. On the whole, September did not show up as well as the previous two months from the standpoint of tonnage, although the number of orders was fairly large. Sellers of special steels in some instances report slightly heavier business for September than for August. The weakest spot in the market continues to be sheets, although 4.75c. to 5.00c. per lb. base still holds fairly firm on black and 5.75c. to 6.00c. per lb. base on galvanized. We quote prices on page 952.

We quote for mill shipments, New York delivery, as follows: Soft steel bars, 2.74c.; plates and structural shapes, 2.84c.; bar iron, 2.74c.

Coke.—Prices of both furnace and foundry show a further decline this week and many producers, particularly those on furnace coke, are reported curtailing operations. At the low quotations prevailing, sellers are not particularly interested in deliveries extending beyond two or three weeks. Standard furnace coke is quotable at from \$4 to \$4.25 per ton, with medium sulphur at \$3.75 per ton and standard foundry ranges from \$5.25 to \$5.75, with certain brands up to \$7 per ton. Many buyers believe that better than these prices could be obtained. By-product coke is quoted at \$11.41, Newark and Jersey City.

Old Material.—The market is evidently slightly weaker on most grades, with so few transactions reported in many cases that it is difficult to determine the current price. Heavy melting steel is quotable at about \$16 per ton, delivered eastern Pennsylvania consumers, with railroad quality or equivalent bringing \$16 and \$16.50, depending upon the shipment. As low as \$15.50 per ton is reported to have been paid for railroad quality delivered to an eastern Pennsylvania consumer. Few shipments of borings and turnings are being made, but \$14 per ton is said to have been paid for delivery to an eastern Pennsylvania mill and \$13.75 to a mill with a slightly higher freight rate. Stove plate has brought \$16.50 per ton, delivered to Harrisburgh, Pa., and \$17.50 per ton delivered to a Connecticut consumer and to New Jersey foundries. Specification pipe is down to \$15 per ton delivered to an eastern Pennsylvania consumer. Cast borings are from \$14.50 to \$15 per ton delivered.

Buying prices per gross ton New York follow:

Heavy melting steel, yard	...	\$12.00 to \$12.50
Steel rails, short lengths, or equivalent	...	13.00 to 13.50
Rails for rolling	...	15.00 to 17.00
Relaying rails, nominal	...	25.00 to 26.00
Steel car axles	...	18.50 to 19.00
Iron car axles	...	25.00 to 26.00
No. 1 railroad wrought	...	14.50 to 15.00
Wrought iron track	...	13.50 to 14.00
Forge fire	...	9.50 to 10.00
No. 1 yard wrought, long	...	13.00 to 13.50
Cast borings (clean)	...	11.00 to 11.50
Machine-shop turnings	...	10.00 to 10.50
Mixed borings and turnings	...	9.50 to 10.00
Iron and steel pipe (1 in. diam. not under 2 ft. long)	...	11.00 to 11.50
Stove plate	...	13.00 to 14.00
Locomotive grate bars	...	13.50 to 14.50
Malleable cast (railroad)	...	17.00 to 18.00
Cast-iron car wheels	...	17.50 to 18.50

Prices which dealers in New York and Brooklyn are quoting to local foundries per gross ton follow:

No. 1 machinery cast	...	\$20.00 to \$21.00
No. 1 heavy cast (columns, building materials, etc.), cupola size	...	19.00 to 20.00
No. 1 heavy cast, not cupola size	...	17.00 to 18.00
No. 2 cast (radiators, cast boilers, etc.)	...	17.00 to 18.00

Cincinnati

Low Prices on Southern Pig Iron Fail to Develop Much Business

CINCINNATI, Oct. 2.—The pig iron market is exceptionally dull, and total sales reported in this district during the past week were probably the smallest for a similar period this year. It was thought that the low prices being quoted on Southern iron would have a stimulating effect on buying, but the opposite seems to be the case, as melters are very hard to interest at any price. Buying still continues to be of the hand-to-mouth character, and foundrymen apparently are only covering for the orders on their books. It is generally admitted that stocks on foundry yards are the lightest for many years, but as transportation service is exceptionally good, and stocks on furnace yards are fairly heavy and well assorted, melters are apparently content to buy only as needed. When purchases are made, however, melters insist on immediate shipment, and furnaces are having many requests to trace shipments of cars which are one or two days late of delivery promises. The price situation remains unchanged from last week. Southern iron is still quoted at \$21, Birmingham, although reports are heard of offers being solicited at less. Southern Ohio iron is still available at \$24.50 for round tonnages, but carload orders are being put through at \$25. The largest sale reported was for 500 tons of Northern to a melter in this district at an undisclosed price. Several sales of 100 tons each were also made. There is little inquiry, the largest being for 150 tons for the Baltimore & Ohio Railroad shops at Newark. Several inquiries from Michigan melters for Southern iron have been withdrawn.

Based on freight rates of \$4.05 from Birmingham and \$2.27 from Ironton, we quote f.o.b. Cincinnati:

Southern coke, sil. 1.75 to 2.25 (base)....	\$25.05
Southern coke, sil. 2.25 to 2.75 (No. 2 soft)	25.55
Ohio silvery, 8 per cent.....	36.77
Southern Ohio coke, sil. 1.75 to 2.25 (No. 2)	26.77
Basic Northern	26.77
Malleable	26.77

Finished Materials.—Some selling agencies report a slight improvement in orders during the past week, but generally speaking the market is quiet, orders being confined to one and two carloads for immediate shipment. Prices on bars, shapes and plates are holding very firmly, however, a good illustration of this being the prices quoted on an inquiry for plates and shapes, which failed to develop a better one than 2.50c., Pittsburgh. However, very attractive delivery promises were made by practically all mills, and this is taken as an indication of the need of tonnage. The order was placed, it is reported, with a mill which will commence shipments 10 days after receipt of order. The bar market is very quiet, and plates and structural steel are being booked at the same rate current for the past few weeks. Wire orders are also light, and prices are said to have been shaded on some lines, but nothing under \$3 per keg has been heard on wire nails. Bolts and nuts, track spikes, boiler tubes and light rails continue to be placed in fair volume. Steel pipe is very active, particularly from jobbers, whose stocks are very low, and who are having difficulty in getting sufficient shipments from mills to take care of the business offering. The Big Four Railroad is inquiring for its fourth quarter requirements of steel, estimated at 2000 tons of miscellaneous items.

Sheets.—A steady demand for blue annealed and galvanized sheets is reported, although tonnages are not heavy. Black sheets are not in heavy demand, and the fact that a good many mills are needing business for this line accounts for the shading of prices. Some of the smaller mills are reported to have made concessions on galvanized sheets, but confirmation is lacking. Demand for tin plate is heavy, but as most mills are reported to have sufficient business now on their books to run well into the first quarter, there is little likelihood of the demand being satisfied. Automobile body sheets are still in fair demand, though most of the body manufacturers have already contracted for fourth quarter requirements. Prices of sheets and tin plate,

with the exception of black sheets, are being maintained at the schedule.

Structural Material.—The week has been a quiet one in so far as inquiries and lettings are concerned. The Third National Bank, Dayton, will, within the next two weeks, call for bids on a banking building, estimated to require over 1200 tons of structural shapes. A local gas holder manufacturer reports receipt of orders for three holders during the week which will require approximately 3000 tons of plates and shapes.

Reinforcing Bars.—The only new inquiry of consequence is for 110 tons for the Tanners' Research Laboratories Building, University of Cincinnati. There have been no important lettings. Prices generally vary from 2.20c. for rerolled bars to 2.40c. for bars from new billets.

Warehouse Business.—Jobbers generally report business fair, the demand being general for all products. Prices are holding firmly, no disposition being apparent to cut prices to secure orders. It is not thought that jobbers are losing business to mills, which are able to make almost immediate delivery.

Cincinnati jobbers quote: Iron and steel bars, 3.50c.; reinforcing bars, 3.60c.; hoops, 4.55c.; bands, 4.25c.; shapes, 3.60c.; plates, 3.60c.; cold-rolled rounds, 4.50c.; cold-rolled flats, squares and hexagons, 5c.; No. 10 blue annealed sheets, 4.25c.; No. 28 black sheets, 5.35c.; No. 28 galvanized sheets, 6.35c.; No. 9 annealed wire, \$3.60 per 100 lb.; common wire nails, \$3.60 per keg base.

Coke.—Some sellers report a little more activity in the coke market, but sales generally are confined to single cars for prompt shipment. There is little contracting for fourth quarter. Prices generally rule about the same as last week. Connellsville furnace coke is quoted to the trade at \$4.50, with foundry bringing \$5 to \$6. Wise County furnace is \$5.50 to \$5.75 and foundry \$6.50 to \$7. New River foundry is quoted at \$12. There will be no change in by-product prices for October, the quotation of \$9, Connellsville basis, standing.

Old Material.—Few sales of scrap are reported. Dealers, however, are still filling out old contracts. Prices have further receded, and some dealers do not think the bottom has yet been reached. Declines range from 50c. to \$1 per ton. Railroad offerings are heavy.

We quote dealers' buying prices, f.o.b. cars Cincinnati:

	Per Gross Ton
Bundled sheets	\$11.50 to \$12.00
Iron rails	14.50 to 15.00
Relaying rails, 50 lb. and up.....	28.00 to 28.50
Rails for rolling.....	15.50 to 16.00
Heavy melting steel.....	14.00 to 14.50
Steel rails for melting.....	14.50 to 15.00
Car wheels	14.00 to 14.50
	Per Net Ton
No. 1 railroad wrought.....	12.50 to 13.00
Cast borings	8.50 to 9.00
Steel turnings	8.00 to 8.50
Railroad cast	15.50 to 16.00
No. 1 machinery cast	18.50 to 19.00
Burnt scrap	12.00 to 12.50
Iron axles	22.50 to 23.00
Locomotive tires (smooth inside)	13.50 to 14.00
Pipes and flues	8.00 to 9.50

Buffalo

Pig Iron Prices Decline and Business Shows Marked Increase

BUFFALO, Oct. 2.—Pronounced weakness has developed in the pig iron market and prices have sagged after several desirable tonnages were sold by Buffalo furnaces. It is now possible to state that the tonnage for the agricultural implement manufacturer near Buffalo has been placed at a Buffalo furnace at a price not greater than \$23.50. The inquiry called for both foundry and malleable iron. The \$23.50 price is probably the lowest that has been done on any tonnage, and several tonnages of fair size delivered in the Buffalo district have been bought at \$24 base. It is understood, however, that the price of \$23.50 was not confined to one sale, but that other transactions involving as high as 2000 tons have been closed at the same figure. One furnace has been especially active in closing new business with both large and small consumers. About 18,000 tons of new business has been closed, most of it

for extended delivery, with only a small part for spot shipment. Several desirable tonnages on which inquiries were put out recently are still open, including the 2000 tons requirement of the Northern New York Railroad equipment maker. One furnace is quoting \$24.50 base on small lots, but it is not possible to get higher than \$24 on business of this character. No 1924 inquiry has appeared to date nor are furnaces anxious to quote on the new year requirements.

We quote f.o.b. gross ton Buffalo as follows:

No. 1 foundry, 2.75 to 3.25 sil.....	\$24.50
No. 2 foundry, 2.25 to 2.75 sil.....	24.00
No. 2 plain, 1.75 to 2.25 sil.....	23.50
Basic	24.00
Malleable	24.00
Lake Superior charcoal.....	30.25

Finished Iron and Steel.—Except for a slight flurry in sheet demand, call for finished material is about on the same level. Some of the new sheet business has come from agricultural interests and isolated quotations of 3.75c. are encountered, but on the whole the 3.85c. price is firm. Bars are holding at 2.40c. and demand shows no particular change. As a comparative proposition, bar prices are generally accepted as satisfactory by consumers. Pipe specifications are heavier because heating appliances work is being speeded up as cold weather approaches.

We quote warehouse prices Buffalo as follows:

Structural shapes, 3.65c.; plates, 3.65c.; soft steel bars, 3.55c.; hoops, 4.65c.; bands, 4.35c.; blue annealed sheets, No. 10 gage, 4.45c.; galvanized steel sheets, No. 28 gage, 6.35c.; black sheets, No. 28 gage, 5.25c.; cold rolled round shafting, 4.70c.	
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Old Material.—Only small sales of heavy melting steel have been made and these to cover immediate needs. Sellers are not confident that any large orders will be placed for the rest of the year and are counting only on fill-in business. The larger mills have made their purchases and are not further interested. Deliveries have been exceptionally good and the railroad situation has been exceptionally satisfactory.

We quote f.o.b. gross ton Buffalo as follows:

Heavy melting steel.....	\$18.00 to \$18.50
Low phos., 0.04 and under.....	23.50 to 24.50
No. 1 railroad wrought.....	15.00 to 16.00
Car wheels	16.50 to 17.00
Machine shop turnings	8.50 to 9.50
Cast iron borings	15.00 to 16.00
No. 1 busheling.....	15.50 to 16.00
Stove plate	17.00 to 17.50
Grate bars	17.00 to 17.50
Bundled sheet stampings	10.00 to 11.00
No. 1 machinery cast.....	19.50 to 20.50
Hydraulic compressed	16.50 to 17.00
Railroad malleable	20.00 to 21.00

Birmingham

Pig Iron Production Still Exceeds Sales—Wage Reductions Started

BIRMINGHAM, ALA., Oct. 1.—Production of pig iron in the South, even with four blast furnaces closed down, continues greater than the aggregate sales. The Woodward Iron Co. is readjusting wages of labor at ore and coal mines. It had a little strike at coal mines Nos. 1 and 3 at Dolomite, but men are accepting a cut of 15 per cent in order to bring about cheaper pig iron costs. Other companies will follow. Labor is not manifesting feeling. This may prevent further curtailment of pig iron production. The ruling price is \$21 per ton, No. 2 foundry. No large tonnage has been sold in the last few days here, some of the steady melters of iron buying for needs of a week or two. The employers assert that wages are around the peak of war times and there have been several reductions in prices at which iron is being sold, a decline of \$7 per ton recently having been recorded. Northern competition is severe, when \$25 is the Northern iron quotation and the freight rate on Birmingham iron into the Chicago territory is \$6.01 per ton. The fourth quarter of the year is starting in with only a part of the probable make sold. The surplus stock, too, will show up beyond 115,000 tons. The Alabama Co., the Gulf States Steel Co. and some other small furnace interests have reduced their stock on hand, but the Sloss-Sheffield Steel & Iron Co., the Woodward

Iron Co. and the Republic Iron & Steel Co. have added some iron to their piles on furnace yards.

We quote per gross ton f.o.b. Birmingham district furnace as follows:

Foundry, silicon 1.75 to 2.25....	\$21.00
Basic	22.00
Charcoal, warm blast.....	\$33.00 to 34.00

Cast Iron Pipe.—Additional awards have been made to the cast iron pipe plants, pressure pipe in particular. The American Cast Iron Pipe Co. has taken on 1024 tons from Ponce, Porto Rico, and 240 tons from Hollywood, Fla. The National Cast Iron Pipe Co. has three of its four DeLavaud machines in operation and the other one will be going by the middle of October. The United States Cast Iron Pipe & Foundry Co. will shortly have six additional DeLavaud machines operating.

Coke.—The coke market continues weak and sales are not numerous, though quotations are soft. Foundry coke, both beehive and by-product, is being quoted at \$7.50 per ton, while furnace coke is from 50c. to \$1 under that price.

Old Material.—There is no improvement in the scrap iron and steel market in the South. Prices are weak; in fact, dealers assert that figures which are given out are nominal and that melters of old material come near making their own prices. Some old contracts still exist and dealers have induced the melters to take the product as ordered some time ago. All scrap yards in the district are being kept well filled, for just as much old material as is moved out is being brought in.

We quote per gross ton f.o.b. Birmingham district yards, nominal prices, as follows:

Cast iron borings, chemical.....	\$18.00 to \$19.00
Heavy melting steel.....	14.00 to 15.00
Railroad wrought	15.00 to 16.00
Steel axles	19.00 to 20.00
Iron axles	23.00 to 24.00
Old steel rails.....	16.00 to 17.00
No. 1 cast.....	19.00 to 20.00
Tram car wheels.....	18.00 to 19.00
Car wheels	17.00 to 18.00
Stove plate	16.00 to 17.00
Machine shop turnings.....	7.00 to 8.00
Cast iron borings.....	8.00 to 9.00

Boston

Buffalo Furnaces Make Low Prices, but Develop Little Business

BOSTON, Oct. 2.—The pig iron market is extremely quiet, with abundant evidence of increased weakness. Reports indicate decreasing activity in nearly all foundries, including some connected with prominent manufacturing concerns. While, some time ago, there was a decided scarcity of molders, this condition has changed, and in most centers in New England there is a surplus of molders. Furnaces in Buffalo have become very aggressive. Although \$24 had been regarded as the usual minimum at Buffalo furnaces, \$23.50 is now freely done on No. 2 plain. On eastern Pennsylvania \$24 is considered the minimum, but the market is unsettled. It is understood that even less than \$21, Birmingham, has been quoted on Southern iron, but it would be necessary to make still lower prices to take business in this territory under present conditions. Virginia iron, at \$25, furnace, is still having much difficulty in this territory in meeting competition. Various reports are current in regard to manufacturers of textile machinery and silk machinery receiving orders from Japan to replace machinery destroyed by the recent earthquake, and it is hoped that these orders will result in considerable increase in demand for pig iron, but nothing definite has developed along these lines. A trial lot of 100 tons of Indian pig iron has been sold in this city at about \$24.50, delivered, for 2.75 to 3.25 silicon.

We quote delivered prices on the basis of the latest reported sales as follows, having added \$3.65 freight from eastern Pennsylvania, \$4.91 from Buffalo, \$5.92 from Virginia, and \$9.60 from Alabama.

East. Penn., sil. 2.25 to 2.75.....	\$28.15
East. Penn., sil. 1.75 to 2.25.....	27.65
Buffalo, sil. 2.25 to 2.75.....	28.91
Buffalo, sil. 1.75 to 2.25.....	28.41
Virginia, sil. 2.25 to 2.75.....	31.42
Virginia, sil. 1.75 to 2.25.....	30.92
Alabama, sil. 2.25 to 2.75.....	31.10
Alabama, sil. 1.75 to 2.25.....	30.60

Finished Material.—On structural material 2.40c., Pittsburgh, is rather freely quoted by the smaller independent companies, but 2.50c. is strongly adhered to by the Steel Corporation and larger independents. Leading fabricators are extremely busy, and will be at least till the end of the year, and are strongly opposed to shading of prices on the plain material, as they believe that such action has a demoralizing effect upon general conditions. Some companies do not yet admit making a quotation of less than 2.50c., Pittsburgh, on plates, and one company states that 90 per cent of its business taken this month was on the 2.50c. basis, but 2.40c. is being done on desirable business. The plate market is dull and depends largely upon boiler manufacturers, owing to the increasing use of Bethlehem shapes in building construction. Specifying for third quarter on bars has been fairly satisfactory and a few contracts have been made for the fourth quarter, but some undelivered third quarter tonnage hangs over into the fourth quarter.

Coke.—Although the foundry business is not so active as it was, the condition does not seem to be reflected in the coke business of the New England Coal & Coke Co. and the Providence Gas Co., which are enjoying excellent business. They are still quoting on a basis of \$13.50, delivered in New England, with no prospect of an immediate change in the price. Prompt shipment Connellsville foundry coke is still selling at \$6 on cars, or \$11.55, delivered, but this price is sometimes shaded.

Old Material.—Dealers who had been holding material for some time, causing a decided stagnation in the market, are showing a disposition to let it go at such prices as can be obtained, and, in some cases, quotations are lower. Heavy melting steel has been reduced about 50c. and is now quoted at \$11.50 to \$12, and a similar decline is noted in wrought pipe, blast furnace borings and turnings and forged scrap. The Boston & Albany is offering a rather large list consisting principally of brake shoes and malleable.

The following prices are for gross ton lots delivered consuming points:

No. 1 machinery cast.....	\$22.50 to \$23.00
No. 2 machinery cast.....	20.50 to 21.00
Stove plate	16.50 to 17.00
Railroad malleable	21.00 to 21.50
Street car axles.....	20.00 to 21.00

The following prices are offered per gross ton lots f.o.b. Boston common rate shipping points:

No. 1 heavy melting steel.....	\$11.50 to \$12.00
No. 1 rail wrought.....	13.50 to 14.00
No. 1 yard wrought.....	12.50 to 13.00
Wrought pipe (1-in. in diam., over 2 ft. long).....	10.50 to 11.00
Machine shop turnings.....	8.50 to 9.00
Cast iron borings, rolling mill.....	9.50 to 10.00
Cast iron borings, chemical.....	12.75 to 13.25
Blast furnace borings and turnings	8.00 to 8.50
Forged scrap and bundled skeleton	8.50 to 9.00
Shafting	18.00 to 18.50
Street car axles.....	18.00 to 18.50
Rails for rerolling.....	13.50 to 14.00

St. Louis

Low Prices Made on Pig Iron Fail to Develop Business

ST. LOUIS, Oct. 2.—The pig iron market is weak. The deep cut to \$21, Birmingham, made by Southern producers the early part of the week failed to produce any new business. In fact, it caused those melters who had been waiting to buy to further delay their purchases in the hope that prices would go still lower. On the present basis, the delivered price for Southern iron in the St. Louis industrial district is \$26.17, as compared with \$28.16, for Northern iron sold at the Chicago price of \$26, plus the freight rate. Some melters are waiting for Northern iron prices to drop to this level. Sales of Southern iron were virtually nothing. As for Northern make, there was one sale of 5000 tons of basic to an East Side melter, but this was sold at Chicago at a price less than \$26. The St. Louis Coke & Iron Co. reduced its price to \$26.50 to \$27.50, Granite City furnace. There is an inquiry for 2000 tons of foundry iron, and other inquiries total perhaps 500 tons. One of the Southern makers now offering iron at \$21 was

holding its make a few weeks ago at \$27, while the market was \$24. The Federal Reserve Bank of St. Louis reports that August sales of seven manufacturing stove interests in the eighth district were 5.3 per cent larger than in August, 1922, and 2.7 per cent over July, 1923.

We quote delivered consumers' yards, St. Louis, as follows, having added to furnace prices \$2.16 freight from Chicago, \$3.28 from Birmingham (rail and water), \$5.17 from Birmingham, all rail, and 81 cents average switching charge from Granite City:

Northern fdy., sil. 1.75 to 2.25.....	\$28.16
Northern malleable, sil. 1.75 to 2.25.....	28.16
Basic	28.17
Southern fdy., sil. 1.75 to 2.25.....	26.17

Finished Iron and Steel.—New rail inquiries are reported. The Kansas City Southern wants 6030 tons of 85-lb. rails; the Gulf Coast lines 4000 tons of 90-lb., and the Missouri Pacific is expected to buy this week.

Coke.—The market for furnace coke is quiet. Connellsville grades have been sold here the last week at prices ranging from \$6 to \$7.25. Warmer weather has caused a lessening demand for domestic grades.

Old Material.—There is no change in prices or in the general situation as regards old material. About the only buying there is comes from dealers, who are putting the material in stock in anticipation of the demand that most of them think will come eventually. One dealer estimates the normal consumption of old material in the St. Louis industrial district at 40,000 tons a month and he believes that stocks in hands of consumers will soon be used up when operations are normal. In the meantime, the mills are interested only in a few specialties, and cars that are in "distress." Railroad lists include: Pennsylvania, Northwestern Region, 3000 tons; Southwestern Region, 7000 tons, and Central Region, 11,000 tons; C., B. & Q., 4800 tons.

We quote dealers' prices f.o.b. consumers' works, St. Louis industrial district and dealers' yards, as follows:

Per Gross Ton	
Iron rails	\$16.00 to \$16.50
Rails for rolling.....	17.50 to 18.00
Steel rails less than 3 ft.....	19.50 to 20.00
Relaying rails, 60 lb. and under.....	26.00 to 27.00
Relaying rails, 70 lb. and over.....	33.50 to 34.50
Cast iron car wheels.....	18.50 to 19.00
Heavy melting steel.....	16.50 to 17.00
Heavy shoveling steel.....	16.50 to 17.00
Frogs, switches and guards cut apart	16.50 to 17.00

Per Net Ton	
Heavy axles and tire turnings.....	12.50 to 13.00
Steel angle bars.....	16.00 to 16.50
Iron car axles	25.00 to 26.00
Steel car axles	18.50 to 19.00
Wrought iron bars and transoms	20.00 to 21.00
No. 1 railroad wrought.....	15.00 to 15.50
No. 2 railroad wrought.....	15.00 to 15.50
Railroad springs	18.00 to 18.50
Cast iron borings	11.50 to 12.00
No. 1 busheling	15.75 to 16.25
No. 1 railroad cast	19.50 to 20.00
No. 1 machinery cast	20.00 to 20.50
Railroad malleable	17.00 to 17.50
Machine shop turnings	11.50 to 12.00
Champion bundled sheets.....	8.00 to 8.50

Detroit Scrap Market

DETROIT, Oct. 2.—Prices on most scrap materials registered a slight decline over those quoted a week ago and the market is "spotty." Tonnages offered by producers on a competitive basis for October delivery confirm this condition. Automobile manufacturers have their production schedules pretty well set for the fourth quarter, the majority of them being on a reduced basis. Manufacturers of automotive castings are forced to quote on a close margin, due to the present intense competition in the automotive industry.

The following prices are quoted on a gross ton basis, f.o.b. cars producers' yards, excepting stove plate, automobile cast and No. 1 machinery cast, which are quoted on a net ton basis:

Heavy melting steel.....	\$14.00 to \$14.50
Shoveling steel	15.00 to 16.00
No. 1 machinery cast.....	17.50 to 18.50
Cast borings	10.75 to 11.75
Automobile cast scrap.....	25.00 to 27.00
Stove plate	16.00 to 17.00
Hydraulic compressed	12.00 to 13.50
Short turnings	11.00 to 12.00
Long turnings	9.50 to 10.50
Flashings	10.00 to 11.00

Cleveland

Ore Shipments Decline—Pig Iron Weak— Finished Material Prices Hold

CLEVELAND, Oct. 2.—Iron ore shipments fell off 1,200,000 tons during September, being 9,095,981 tons for the month as compared with 10,296,133 tons during August. Shipments during September were 2,294,682 tons greater than during the corresponding month last year. Shipments by water up to Oct. 1 were 45,988,845 tons or an increase of 12,877,607 tons, or 39 per cent over the corresponding period last year.

Pig Iron.—Prices have declined and the market is weak. Basic iron is now quoted at \$24 Valley furnace, and a sale of 1500 tons has been made at that price by a Cleveland interest for shipment from a western Pennsylvania furnace. In this case the seller had a freight rate advantage of over 30c., the rate from the shipping to the consuming point being \$1.39. Locally the market on foundry and malleable iron has declined 50c. to \$25 at furnace for Cleveland delivery. In the Valley district, \$24.50 now appears to be the top price on foundry iron and \$24 quotations have appeared. The Buffalo market is decidedly weak, with quotations reported at as low as \$23 with extras waived. The market is unusually dull and consumers as a rule are buying only in small lots. Many consumers will need additional iron during the present quarter, but feel that prices will go no higher and possibly may go lower and consequently are deferring buying. On the other hand, a few sales during the week were for the first quarter or for deliveries extending into that quarter. A Cleveland interest has sold 500 tons to the Westinghouse Electric & Mfg. Co. for its Trafford City plant at \$24.50 Valley furnace. Other sales include one 2000 ton lot and a 1000 ton lot of foundry and malleable iron.

A Sharon consumer has purchased 1000 tons of basic iron from a broker at \$24.50, this to be shipped from a Valley furnace having a 50c. freight rate. A Cleveland consumer during the week purchased 500 tons of malleable iron from a local furnace. Some of the Westinghouse business is reported to have been placed at as low as \$23.25, Valley furnace.

Quotations below, except on basic and low phosphorus iron, are delivered Cleveland, and for local iron include a 50c. switching charge. Ohio silvery and Southern iron prices are based on a \$3.02 freight rate from Jackson and \$6 rate from Birmingham:

Basic, Valley furnace.....	\$24.00
Northern No. 2 fdy., sil. 1.75 to 2.25.....	25.50
Southern fdy., sil. 1.75 to 2.25.....	28.00
Malleable	25.50
Ohio silvery, 8 per cent.....	37.52
Standard low phos., Valley furnace.....	30.00

Finished Iron and Steel.—Mills are getting a fair volume of small orders for steel bars and structural material. Plates are quiet. Some buyers are making new efforts to break prices, evidently because of the weakness that has developed in plates in the East. However, while competition is unusually keen, prices appear to be holding to 2.40c. for steel bars and 2.50c. for plates and structural material. Local plate mills are feeling the competition of Chicago district mills selling at 2.60c., Chicago. Hot-rolled strip steel is weak with the 3c. quotation quite common. The two ore boats ordered by the Ford Motor Co. will require 10,000 tons of plates and structural material, which will probably be placed with the leading interest. The two car ferries inquired for by the Canadian National Railways have not yet been placed. The Willys-Overland Co. has purchased 6600 tons of steel bar products, about 4000 tons of this being for October shipment. The volume of inquiry in the building field shows an improvement. The Babes' and Children's and Maternity Hospital, Cleveland, reported last week as requiring 1000 tons of steel, will take under the revised plans 1500 tons. The first inquiry for steel growing out of the construction of the new Union Station, Cleveland, has come out, being for 500 tons of structural material and reinforcing bars for replacing a grade separation bridge. The Brotherhood of Locomo-

tive Engineers Building, Cleveland, for which bids will be received shortly, will require 500 tons of steel piling. The Bethlehem Steel Co. has taken 1500 tons of rails for the Clover Leaf Railroad, this being the first rail purchase in this territory for 1924.

Jobbers quote steel bars, 3.36c.; plates and structural shapes, 3.46c.; No. 9 galvanized wire, 3.70c.; No. 9 annealed wire, 3.25c.; No. 28 black sheets, 4.40c. to 4.65c.; No. 28 galvanized sheets, 5.50c. to 5.80c.; No. 10 blue annealed sheets, 3.75c. to 4.06c.; cold rolled rounds, 3.90c.; flats, squares and hexagons, 4.40c.; hoops and bands, 1 in. and wider and 20 gage or heavier, 4.16c.; narrower than 1 in. or lighter than No. 20 gage, 4.60c.

Sheets.—The demand for sheets continues rather light, although automobile body sheets are moving fairly well. Automobile companies as a rule are placing orders only for monthly requirements. On black sheets 3.75c. is commonly quoted. On galvanized sheets a 4.75c. price has appeared, but this price may have been named only on surplus stock. Blue annealed sheets are firm.

Reinforcing Bars.—New demand is fair, but prices are irregular. Some manufacturers of deformed bars who are using steel bars supplied on old contracts at much lower than present prices, are naming a very low price. On rail steel bars 2.25c. is a common price. New inquiries include 250 tons for the West Twenty-fifth Street bridge, Cleveland, and 400 tons for a warehouse for the Fisher Body Corporation, Cleveland.

Semi-Finished Steel.—The softening of the semi-finished steel market has resulted in the holding back of some prospective business until the price situation is more clearly defined. A Cleveland consumer this week was offered a round tonnage of sheet bars at \$42 delivered. It has developed that on a recent inquiry for billets a \$42 delivered price was named, this being quoted by more than one mill. A Valley district mill has taken 5000 tons of skelp for the fourth quarter at 2.35c., Pittsburgh.

Bolts, Nuts and Rivets.—Makers are booking a good volume of contracts for bolts and nuts, mostly from the railroads and automobile companies, but not much business is coming from jobbers, who have good stocks and shipments due on old contracts. Local manufacturers generally are holding to 60 and 5 per cent off list for large machine bolts, although some makers are allowing an additional discount of from 2½ to 5 per cent. The rivet market lacks firmness. While 2.90c. to 3c. are the more common prices, a 2.80c. price has appeared, and there is the possibility that some manufacturers will not attempt to hold to the 3c. price in making contracts for the fourth quarter.

Coke.—The foundry coke market is very weak, with standard Connellsville makes quoted at \$5.25 to \$6.75. The market is dull.

Old Material.—Prices have further declined 50c. a ton on heavy melting steel and several other grades and the market is still moderately weak. There is some demand from blast furnaces for borings and turnings, round lot sales of these grades being reported in Pittsburgh and Buffalo. Other grades are inactive. Mills are taking shipments on contracts in good volume and dealers are well covered on old orders, so there is little activity between dealers. The embargo against scrap to the Weirton Steel Co. has been lifted.

We quote dealers' prices f.o.b. Cleveland per gross ton:

Heavy melting steel.....	\$15.50 to \$16.00
Rails for rolling.....	19.00 to 19.50
Rails under 3 ft.....	18.00 to 18.50
Low phosphorus melting.....	19.50 to 20.00
Cast borings	12.75 to 13.00
Machine shop turnings	12.50 to 12.75
Mixed borings and short turnings	12.50 to 12.75
Compressed sheet steel.....	15.00 to 15.50
Railroad wrought	15.00 to 15.25
Railroad malleable	21.00 to 21.50
Light bundled sheet stampings..	12.00 to 12.50
Steel axle turnings	14.50 to 15.50
No. 1 cast	21.00 to 22.00
No. 1 busheling	11.50 to 12.00
Drop forge flashings	12.00 to 12.50
Railroad grate bars	17.00 to 17.50
Stove plate	16.00 to 17.00
Pipes and flues	12.50 to 13.00

Philadelphia

Prices of Pig Iron, Scrap and Coke Decline Still Further

PHILADELPHIA, Oct. 2.—Further declines in pig iron, scrap and coke, with spotty weakness in some steel products, have developed. Foundry pig iron is off fully \$1 a ton from last week's published quotations, nearly all grades of scrap have declined 50c. or \$1 a ton, while coke is 50c. a ton lower than a week ago. The chief weakness in steel products is on plates and shapes, due largely to the urgent need of Eastern mills for orders. Both plates and shapes are now quite generally quoted by the mills of this district at 2.40c., Pittsburgh, for the more desirable orders, though there are one or two plate mills which are slow to adopt this price in spite of competition. There is slight weakness in black sheets, quoted by one or two small mills at 3.75c., Pittsburgh, and in bolts, nuts and rivets, but other finished steel lines are firm. The larger Pittsburgh and Youngstown mills have, so far as is known, shown no deviation from the prices which have been in effect for some months. Nothing has developed in the way of new business to give cause for encouragement; on the contrary, the small volume now being booked, being so much less than shipments, points to a more rapid diminishing of the backlogs which some of the companies have enjoyed throughout the year.

Pig Iron.—The weakness which has been developing in the pig iron market for some time reached a more acute stage in the past week, when a decline of fully \$1 a ton from last week's published prices resulted from keen competition over the meager tonnage available. On the base grade, No. 2 plain, \$24, furnace, is being freely quoted on even the smallest tonnages, though some quotations are 50c. a ton higher, while on the few desirable lots that have been closed quotations have been at \$23.50. A Dover, N. J., stove manufacturer closed for 2000 tons, and on at least a part of this tonnage \$23.50, furnace, was shaded. The fact that the iron is to be shipped this month contributed to the willingness of one or two furnaces to go to this low figure. Early last week a cast iron pipe company bought 3000 tons of eastern Pennsylvania iron and this business developed prices somewhat in line with today's market. There is very little foundry iron business in the immediate Philadelphia territory. A good deal more competition has been in evidence in the New York and New England territories, where quotations of \$23, furnace, on Buffalo iron have been encountered. The Virginia situation is weaker, sales having been made to a pipe interest in that State at \$24, furnace. Production in Virginia is being cut down because of the small demand, and shortly there will be only a few furnaces operating.

The following quotations are, with the exception of those on low phosphorus iron, for delivery at Philadelphia and include freight rates varying from 76 cents to \$1.63 per gross ton:

East. Pa. No. 2 plain, 1.75 to 2.25 sil.	\$24.26 to \$25.13
East. Pa. No. 2X, 2.25 to 2.75 sil.	24.76 to 26.13
East. Pa. No. 1X.	25.26 to 26.63
Virginia No. 2 plain, 1.75 to 2.25 sil.	29.17 to 30.17
Virginia No. 2X, 2.25 to 2.75 sil.	30.17 to 30.67
Basic delivered eastern Pa.	25.00
Gray forge	25.00 to 25.50
Malleable	25.00 to 26.00
Standard low phos. (f.o.b. furnace)	28.00 to 30.00
Copper bearing low phos. (f.o.b. furnace)	28.00

Ferroalloys.—Resale ferromanganese still dominates the market, being available at \$108 to \$110, furnace or seaboard, which is lower than domestic furnaces or importers are willing to go. Spiegeleisen is to be had at \$44 to \$45, furnace.

Semi-Finished Steel.—Although there is little business to test the market, Eastern mills appear willing to meet competition of Pittsburgh mills on billets. While quotations nominally are \$42.50 for rerolling and \$47.50 for forging billets, these prices would undoubtedly be cut \$2.50 a ton on desirable orders.

Plates.—The Eastern plate situation is acute. Not only is the price more definitely established at 2.40c., Pittsburgh, it being almost impossible to obtain more

than this except on less than carload lots, but the current rollings are very light. One mill last week rolled only about 15 per cent of its normal capacity, but its specifications this week are better, permitting about a 33-1/3 per cent operation in the finishing department. The increase in rollings this week was due largely to specifications coming in at the end of the month on expiring contracts. Some mills report a slight increase in new orders, but the tonnages are small.

Structural Material.—Two Eastern mills are now freely quoting 2.40c., Pittsburgh, while one or two of the larger mills are said to have met this price when regular customers insisted. There is very little structural work in prospect in this territory. Orders being put on mills' books are less than the rate of shipments.

Bars.—Rerolled concrete bars are being offered at 2.30c., Pittsburgh, and even this price is said to have been shaded, but bars rolled from new steel by the larger mills are being firmly held at 2.40c. Bar iron is quite generally quoted at 2.35c., Pittsburgh, though there are still some quotations of 2.40c.

Sheets.—Galvanized and blue annealed sheets are firm at 5c. and 3c., Pittsburgh, respectively, but one or two of the smaller mills have quoted black sheets at 3.75c., \$2 a ton under the quotation of the larger mills.

Bolts, Nuts and Rivets.—Weakness has developed in bolts, nuts and rivets. On large machine bolts 60 and 5 per cent off list is being freely shaded. Structural rivets have been quoted at 2.85c., Pittsburgh. Nuts are also weaker.

Rails.—Orders have not been distributed by the Pennsylvania Railroad on the 100,000 tons of rails it is expected to buy for 1924 delivery, nor by the Philadelphia & Reading on the 25,000 tons it will require.

Ore.—Iron ore receipts last week from abroad were as follows: Germany, 2000 tons; Newfoundland, 7750 tons; Sweden, 13,707 tons. Chrome ore, 1002 tons from British India; manganese ore, 575 tons from Chili.

Coke.—Some of the Connellsville coke ovens are offering spot furnace coke at prices 50c. below last week's quotations in the hope of getting enough orders to avoid going out. Furnace coke is now to be had for prompt shipment at \$4 to \$4.25, ovens, while some off-grade coke has been offered at \$3.75. Foundry coke is about \$1 a ton higher.

Old Material.—Scrap prices have fallen to lower levels, generally 50c. or \$1 a ton below last week's quotations on nearly all grades. The market is extremely weak, and there isn't sufficient demand to promise any betterment within the near future. No. 1 heavy melting steel is available at \$16 to \$16.50, delivered at Eastern plants. Last week's quotations on No. 1 railroad wrought and No. 1 yard wrought were in juxtaposition. The correct quotations for that date were \$18 to \$18.50 on railroad wrought and \$17 to \$18 on yard wrought. The latter is lower this week. A shipment of 2283 tons of scrap from San Domingo reached this port last week.

We quote for delivery at consuming points in this district as follows:

No. 1 heavy melting steel	\$16.00 to \$16.50
Scrap rails	16.00 to 16.50
Steel rails for rolling	18.50 to 19.00
No. 1 low phos., heavy 0.04 and under	22.00 to 23.00
Cast-iron car wheels	20.50 to 21.50
No. 1 railroad wrought	18.00 to 18.50
No. 1 yard wrought	16.00 to 17.00
No. 1 forge fire	14.00 to 14.50
Bundled sheets (for steel works)	14.00 to 14.50
No. 1 busheling	15.00 to 15.50
Mixed borings and turnings (for blast furnace use)	12.00 to 12.50
Machine shop turnings (for steel works use)	14.00 to 14.50
Machine shop turnings (for rolling mill use)	14.00 to 14.50
Heavy axle turnings (or equivalent)	15.00 to 15.50
Cast borings (for steel works and rolling mills)	14.50 to 15.00
Cast borings (for chemical plants)	17.00 to 17.50
No. 1 cast	20.50 to 21.00
Heavy breakable cast (for steel plants)	19.00 to 19.50
Railroad grate bars	17.00 to 18.00
Stove plate (for steel plant use)	17.00 to 18.00
Railroad malleable	26.00 to 20.50
Wrought iron and soft steel pipes and tubes (new specifications)	15.50 to 16.00
Shafting	24.00 to 25.00
Steel axles	22.00 to 22.50

Carload Lots

Plates	
Sheared tank quality, base, per lb.	2.50c.

Structural Materials	
Beams, channels, etc., base, per lb.....	2.50c.
Sheet piling	2.65c.

Soft steel bars, base, per lb.....	2.40c.
Soft steel bars for cold finishing.....	\$3 per ton over base
Reinforcing steel bars, base.....	2.40c.
Refined iron bars, base, per lb.....	3.25c.
Double refined iron bars, base, per lb.....	4.85c. to 5.00c.
Stay bolt iron bars, base, per lb.....	8.00c. to 8.50c.

Hoops, base, per lb.	3c. to 3.15c.
Bands, base, per lb.	3c. to 3.15c.
Strips, base, per lb.	3.00c. to 3.15c.
Cotton ties, per bundle of 45 lb.	\$1.63

Bars and shafting, base, per lb.....	3.25c.
Bars, S. A. E. Series, No. 2100.....	4.50c. to 4.75c.
Bars, S. A. E. Series, No. 2300.....	6.50c. to 6.75c.
Bars, S. A. E. Series, No. 3100.....	5.50c. to 5.75c.
Strips, base, per lb.....	5.00c.

Wire Products		\$3.00
Nails, base, per keg.....		\$3.00
Galvanized nails, 1 in. and over.....	\$2.25 over base	
Galvanized nails, less than 1 in.....	2.50 over base	
Bright plain wire, base, No. 9 gage, per 100 lb.....	2.75	
Annealed fence wire, base, per 100 lb.....	2.90	
Spring wire, base, per 100 lb.....	3.70	
Galvanized wire, No. 9, base, per 100 lb.....	3.35	
Galvanized barbed, base, per 100 lb.....	3.80	
Galvanized staples, base, per keg.....	3.80	
Painted barbed wire, base, per 100 lb.....	3.45	
Polished staples, base, per keg.....	3.45	
Cement coated nails, base, per count keg.....	2.70	
Woven fence, carloads (to jobbers).....	67½ per cent off list	
Woven fence, carloads (to retailers).....	65 per cent off list	

Machine bolts, small, rolled threads,
60, 10 and 10 to 60, 10 and 5 per cent off list
Machine bolts, small, cut threads,
60 and 10 to 60 and 5 per cent off list
Machine bolts, larger and longer,
60 and 10 to 60 and 5 per cent off list

Smaller and shorter, rolled threads.....	60 and 10 to 60 and 5	per cent off list
Cut threads.....	60 to 50, 10 and 5	per cent off list
Larger and longer.....	60 to 50, 10 and 5	per cent off list
Lag bolts.....	65 and 10 to 65 and 5	per cent off list
Plow bolts, Nos. 1, 2 and 3 heads.....	50 and 10	per cent off list
Other style heads.....		20 per cent extra
Machine bolts, c.p.c. and t. nuts, $\frac{3}{8}$ x 4 in.,		

Larger and longer sizes.....	50 and 5 per cent off list
Hot pressed square or hex. nuts, blank.....	4.00c. off list
Hot pressed nuts, tapped.....	4.00c. off list
C.p.c. and t. square or hex. nuts, blank.....	3.75c. off list
C.p.c. and t. square or hex. nuts, tapped.....	3.75c. off list
Semi-finished hex. nuts:	

5/8 in. and larger, U. S. S.	75	per cent off list
Small sizes, S. A. E.	80 and 5	per cent off list
S. A. E., 5/8 in. and larger	75 and 5	per cent off list
Stove bolts in packages	75, 10 and 5	per cent off list
Stove bolts in bulk	75, 10, 5 and 2 1/2	per cent off list
Tire bolts	60 and 10	per cent off list
Bolt ends with hot pressed nuts	60 and 5	per cent off list
Turnbuckles, with ends, 1/4 in. and smaller		

Turnbuckles, without ends, 1/2 in. and smaller, 70 and 10 to 65 and 5 per cent off list
Washers 5c. to 5.25c. off list

Milled square and hex. head cap screws.....	70	per cent off list
Milled set screws.....	70	per cent off list
Upset cap screws.....	75 and 10	per cent off list
Upset set screws.....	75 and 10	per cent off list
Milled studs.....	50 and 10	per cent off list

Rivets
Large structural and ship rivets, base, per 100 lb. \$2.75 to \$3.00
Small rivets 65 and 10 off list

Spikes, $\frac{9}{16}$ in. ad larger, base, per 100 lb.....	\$3.15	\$3.15
Spikes, $\frac{1}{2}$ in. $\frac{5}{8}$ in. and $\frac{3}{4}$ in., per 100 lb.....	3.15	3.50
Spikes, $\frac{3}{4}$ in.....	3.15	3.50
Spikes, boat and barge, base, per 100 lb.....	3.15	3.50
Track bolts, $\frac{3}{4}$ in. and larger, base, per 100 lb.....	\$4.00	4.25
Track bolts, $\frac{1}{2}$ in. and $\frac{5}{8}$ in., base, per 100 lb.....	5.00	5.50
Tie plates, per 100 lb.....	2.55	2.60
Angle bars, base, per 100 lb.....		2.75

All freight rates from Pittsburgh on finished iron and steel products, carload lots, per 100 lb.:

Philadelphia, domestic, \$0.32				Buffalo, domestic, \$0.265				St. Louis, domestic, \$0.43				Pacific Coast, domestic, \$1.34			
Philadelphia, export, 0.235				Cleveland, 0.215				Kansas City, 0.735				Pac. Coast, ship plates, 1.20			
Baltimore, domestic, 0.31				Cleveland, 0.215				Kansas City (pipe), 0.705				Birmingham, 0.58			
Baltimore, export, 0.225				Comb., 0.19				St. Louis, 0.60				Memphis, 0.70			
New York, domestic, 0.34				Detroit, 0.29				Omaha, 0.735				Jacksonville, all rail, 0.415			
New York, export, 0.255				Cincinnati, 0.29				Omaha (pipe), 0.705				Jacksonville, rail and water, 0.67			
Boston, domestic, 0.365				Indianapolis, 0.31				Denver, 1.27				New Orleans, 0.67			
Boston, export, 0.255				Chicago, 0.34				Denver (pipe), 1.215							

The minimum carload to most of the foregoing points is 6000 lb. To Denver the minimum loading is 40,000 lb., while to the Pacific Coast on all iron and steel products, except structural material, the minimum is 80,000 lb. On the latter item the rate applies to a minimum of 50,000 lb., and there is an extra charge of 9c. per 100 lb. on carloads of a minimum of 40,000 lb. On shipments of wrought iron and steel pipe to Kansas City, St. Paul, Omaha and Denver the minimum carload is 46,000 lb. On iron and steel items not noted above the rates vary somewhat and are given in detail in the regular railroad tariffs.

Rates from Atlantic Coast ports (i.e., New York, Philadelphia and Baltimore) to Pacific Coast ports of call on most steamship lines, via the Panama Canal, are as follows: Pig iron, 35c.; ship plates, 40c.; ingot and muck bars, structural steel, common wire products including cut or wire nails, spikes, and wire hoops, 40c.; sheets and tin plates, 40c.; sheets, No. 12 gage and lighter, 50c.; rods, 40c.; wire rope cables and strands, 45c.; wire fencing, netting and stretcher, 40c.; pipes not over 12 in. in diameter, 55c.; over 12 in. in diameter, 2½c. per in. or fraction thereof additional. All prices per 100 lb. in carload lots, minimum 40,000 lb.

Butt Weld

Steel		Built with		Iron	
Inches	Black	Galv.	Inches	Black	Galv.
1 1/8	45	19 1/2	1/4 to 3/8	+11	+39
1/4 to 3/8	51	25 1/2	1/2	22	2
1/2	56	42 1/2	3/4	28	11
3/4	60	48 1/2	1 to 1 1/2	30	13
1	62				

2	55	43 1/2	2	23	7
2 1/2 to 6	59	47 1/2	2 1/2	26	11
7 and 8	56	43 1/2	3 to 6	28	13
9 and 10	54	41 1/2	7 to 12	26	11

Butt Weld, extra strong, plain ends					
1/4	41	24 1/2	2 to 3..... 61	50 1/2
1/4	to 3/8	47	30 1/2	1/4 to 3/8..... + 19	+ 54
1/2	53	42 1/2	1/2	21
3/4	58	47 1/2	3/4	7
1	to 1 1/4	60	49 1/2	1 to 1 1/4..... 28	12
				1 to 1 1/2..... 30	14

2	53	42½	2	23	9
2½ to 4	57	46½	2½ to 4	29	15
4½ to 6	56	45½	4½ to 6	28	14
7 to 8	52	39½	7 to 8	21	7
9 and 10	45	32½	9 to 12	16	2
11 and 12	44	31½			

To the large jobbing trade the above discounts are increased by one point, with supplementary discounts of 5 per cent on black and 1½ points, with a supplementary discount of 5 per cent on galvanized.

Lap Welded Steel		Charcoal Iron
2 to 2 1/4 in.	27	1 1/2 in. + 18
2 1/4 to 2 3/4 in.	37	1 3/4 to 1 7/8 in. + 8
3 in.	40	2 to 2 1/4 in. - 7
3 1/4 to 3 3/4 in.	42 1/2	2 1/2 to 3 in. - 2
4 to 13 in.	46	3 1/4 to 4 1/2 in. - 9

Less carload lots 4 points less

Standard Commercial Seamless Boiler Tubes			
		Cold Drawn	
1 in.	55	3 and 3½ in.	36
1½ in.	47	3½ and 3¾ in.	37
1¾ in.	31	4 in.	41
2 and 2½ in.	22	4½ in. and 5 in.	33
2½ and 2¾ in.	32		

	<i>Hot Rolled</i>	
3 and 3¼ in.....	38	4 in. 43
3½ in. and 3¾ in....	39	

Less carloads, 4 points less. Add \$8 per net ton for more than four gages heavier than standard. No extras for lengths up to and including 24 ft. Sizes smaller than 1 in. and lighter than standard gage to be sold at mechanical tube list and discount. Intermediate sizes and gages not listed take price of net larger outside diameter and heavier gage.

Carbon under 0.30, base.....83 per cent off list
Carbon 0.30 to 0.40, base.....81 per cent off list
Plus usual differentials and extras for cutting. Ware
house discounts range higher.

Cents per Ft.		Cents per Ft.	
2-in. O.D. 12 gage...	15	2¼-in. O.D. 10 gage...	20
2-in. O.D. 11 gage...	16	3-in. O.D. 7 gage...	35
2-in. O.D. 10 gage...	17	1½-in. O.D. 9 gage...	15
2½ in. O.D. 12 gage...	17	5½-in. O.D. 9 gage...	55
2½-in. O.D. 11 gage...	18	5½-in. O.D. 9 gage...	57

Standard cokes, per base box.....	\$5.5
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(Per Package, 20 x 28 in.)	
8-lb. coating, 100 lb. base	\$11.00
8-lb. coating I. C.	11.30
12-lb. coating I. C.	12.70
15-lb. coating I. C.	13.95
20-lb. coating I. C.	\$14.9
25-lb. coating I. C.	16.2
30-lb. coating I. C.	17.3
35-lb. coating I. C.	18.3
40-lb. coating I. C.	19.3

Blue Annealed	
Nos. 9 and 10 (base), per lb.....	3.00c
Hot Annealed, One Pass Cold Rolled	

No. 28 (base), per lb.....3.75c. to 3.85c

Regular auto body sheets, base (22 gage), per lb.....5.35¢

No. 28 (base), per lb.....	5.00
<i>Long Tonnes</i>	

Tin-Mill Black Plate

Notes

Prices of Raw Materials, Semi-Finished and Finished Products

Ores

Lake Superior Ores, Delivered Lower Lake Ports

Old range Bessemer, 55 per cent iron.....	\$6.45
Old range non-Bessemer, 51½ per cent iron.....	5.70
Mesabi Bessemer, 55 per cent iron.....	6.20
Mesabi non-Bessemer, 51½ per cent iron.....	5.55

Foreign Ore, per Unit, c.i.f. Philadelphia or Baltimore

Iron ore, low phos., copper free, 55 to 58 per cent iron in dry Spanish or Algerian..	10.50c.
Iron ore, Swedish, average 66 per cent iron	10.50c.
Manganese ore, washed, 51 per cent manganese, from the Caucasus, nominal.....	42c.
Manganese ore, ordinary, 48 per cent manganese, from the Caucasus.....	39c.
Manganese ore, Brazilian or Indian, nominal	42c.
Tungsten ore, per unit, in 60 per cent concentrates	\$8.25 to \$10.00
Chrome ore, basic, 48 per cent Cr ₂ O ₃ , crude, per ton, c.i.f. Atlantic seaboard.....	18.00 to 28.00
Molybdenum ore, 85 per cent concentrates, per lb. of MoS ₂ , New York.....	75c. to 85c.

Ferroalloys

Ferromanganese, domestic, 80 per cent, furnace, or seaboard, per ton.....	\$110.00
Ferromanganese, British, 80 per cent, f.o.b. Atlantic port, duty paid.....	\$108.00 to 110.00
Spiegeleisen, domestic, 19 to 21 per cent, per ton, furnace	43.00 to 45.00
Spiegeleisen, domestic, 16 to 19 per cent, furnace, per ton.....	42.00 to 44.00
Ferrosilicon, 50 per cent, delivered, per gross ton	80.00 to 82.50
Ferrosilicon, Bessemer, 10 per cent, per ton, furnace	43.50
Ferrosilicon, Bessemer, 11 per cent, per ton, furnace	46.80
Ferrosilicon, Bessemer, 12 per cent, per ton, furnace	50.10
Ferrosilicon, Bessemer, 13 per cent, per ton, furnace	54.10
Ferrosilicon, Bessemer, 14 per cent, per ton, furnace	59.10
Silvery iron, 6 per cent, per ton, furnace..	32.00
Silvery iron, 7 per cent, per ton, furnace..	33.00
Silvery iron, 8 per cent, per ton, furnace..	34.50
Silvery iron, 9 per cent, per ton, furnace..	36.50
Silvery iron, 10 per cent, per ton, furnace..	38.50
Silvery iron, 11 per cent, per ton, furnace..	41.80
Silvery iron, 12 per cent, per ton, furnace..	45.10
Ferrotungsten, per lb. contained metal....	88c. to 90c.
Ferrochromium, 4 to 6 per cent carbon, 60 to 70 per cent Cr. per lb. contained Cr. delivered	12c.
Ferrochromium, 6 to 7 per cent carbon, 60 to 70 per cent Cr., per lb.....	11.50c.
Ferrovanadium, per lb. contained vanadium	\$3.50 to \$4.00
Ferrocobaltititanium, 15 to 18 per cent, per net ton	200.00

Fluxes and Refractories

Fluorspar, 80 per cent and over calcium fluoride, not over 5 per cent silica, per net ton f.o.b. Illinois and Kentucky mines				\$22.00
Fluorspar, 85 per cent and over calcium fluoride, not over 5 per cent silica, per net ton f.o.b. Illinois and Kentucky mines				23.50
Per 1000 f.o.b. works:				
Fire Clay:		High Duty	Moderate Duty	
Pennsylvania	\$45.00 to	\$48.00	\$40.00 to	\$45.00
Maryland		50.00		45.00
Ohio	45.00 to	46.00	40.00 to	42.00
Kentucky	45.00 to	46.00	40.00 to	42.00
Illinois			40.00 to	45.00
Missouri	45.00 to	48.00	38.00 to	43.00
Ground fire clay, per net ton.....			6.50 to	7.50
Silica Brick:				
Pennsylvania			42.00 to	45.00
Chicago				52.00
Birmingham				53.00
Ground silica clay, per net ton.....				9.00
Magnesite Brick:				
Standard size, per net ton (f.o.b. Baltimore and Chester, Pa.)				65.00
Grain magnesite, per net ton (f.o.b. Baltimore and Chester, Pa.).....				40.00
Chrome Brick:				
Standard size, per net ton.....				50.00

Semi-Finished Steel, f.o.b. Pittsburgh or Youngstown, per gross ton

Rolling billets, 4-in. and over.....	\$40.00 to \$42.50
Rolling billets, 2-in. and under.....	40.00 to 42.50
Forging billets, ordinary carbons.....	47.50
Sheet bars, Bessemer	\$40.00 to 42.50
Sheet bars, open-hearth.....	40.00 to 42.50

Slabs	\$42.50
Wire rods, common soft, base, No. 5 to ¼-in.	51.00
Wire rods, common soft, coarser than ¼-in.	\$2.50 over base
Wire rods, screw stock.....	\$5 per ton over base
Wire rods, carbon 0.20 to 0.40.....	3 per ton over base
Wire rods, carbon 0.41 to 0.55.....	5 per ton over base
Wire rods, carbon 0.56 to 0.75.....	7.50 per ton over base
Wire rods, carbon over 0.75.....	10 per ton over base
Wire rods, acid	15 per ton over base
Skelp, grooved, per lb.....	2.40
Skelp, sheared, per lb.....	2.40
Skelp, universal, per lb.....	2.40

Finished Iron and Steel, f.o.b. Mill

Rails, heavy, per gross ton.....	\$43.00
Rails, light, new steel, base, per lb.....	2.15c. to 2.25c.
Rails, light, rerolled base, per lb.....	1.90c. to 2.00c.
Spikes, ½-in. and larger, base, per 100 lb....	\$3.15
Spikes, ½-in., ⅞-in. and ¾-in., base per 100 lb.	\$3.15 to 3.50
Spikes, ⅞-in., base, per 100 lb.....	3.15 to 3.50
Spikes, boat and barge, base, per 100 lb.....	3.50
Track bolts, ¾-in. and smaller, base, per 100 lb.	4.15 to 4.25
Track bolts, ¾-in. and larger, base, per 100 lb.	4.75 to 5.50
Tie plates, per 100 lb.....	2.55 to 2.60
Angle bars, per 100 lb.....	2.75
Bars, common iron, base, per lb., Chicago mill.	2.50c.
Bars, common iron, Pittsburgh mill.....	2.40c.
Bars, rails, steel reinforcing, base, per lb.....	2.15c. to 2.25c.
Ground shafting, base, per lb.....	3.65c.
Cut nails, base, per keg.....	\$3.15 to \$3.25

S. A. E. Semi-finished Castellated Nuts and U. S. S. Semi-finished Slotted Nuts

(To jobbers and consumers in large quantities f.o.b. Pittsburgh.)

	Per 1000	
	S. A. E.	U. S. S.
¼-in.	\$ 4.80	\$ 4.80
⅝-in.	5.50	6.00
¾-in.	6.50	7.00
⅞-in.	9.00	9.50
1-in.	11.00	11.50
1 ⅛-in.	15.00	15.00
1 ¼-in.	19.50	20.00
1 ½-in.	28.50	28.50
1 ¾-in.	37.00	37.50
2-in.	58.50	60.50
2 ¼-in.	88.00	97.00
2 ½-in.	132.00	132.00
2 ¾-in.	176.00	176.00
3-in.	220.00	220.00

Larger sizes—Prices on application

Alloy Steel

S. A. E. Series Numbers	Bars 100 lb.
2100* (¼% Nickel, 10 to 20 per cent Carbon)...	\$3.25 to \$3.50
2300 (3½% Nickel)	5.25 to 5.50
2500 (5% Nickel)	7.75 to 8.00
3100 (Nickel Chromium)	4.25 to 4.50
3200 (Nickel Chromium)	6.00 to 6.25
3300 (Nickel Chromium)	8.00 to 8.25
3400 (Nickel Chromium)	7.00 to 7.25
5100 (Chromium Steel)	3.75 to 4.00
5200* (Chromium Steel)	8.00 to 8.25
6100 (Chromium Vanadium bars).....	5.00 to 5.25
6100 (Chromium Vanadium spring steel).....	4.75 to 5.00
9250 (Silico Manganese spring steel).....	3.75 to 4.00
Nickel Chrome Vanadium (0.60 Nickel, 0.50 Chromium, 0.15 Vanadium)	5.25 to 5.50
Chromium Molybdenum bars (0.80—1.10 Chromium, 0.25—0.40 Molybdenum).....	4.50 to 4.75
Chromium Molybdenum bars (0.50—0.70 Chromium, 0.15—0.25 Molybdenum).....	4.25 to 4.50
Chromium Molybdenum spring steel (1—1.25 Chromium, 0.30—0.50 Molybdenum).....	4.25 to 4.50

Above prices are for hot-rolled alloy steel bars, forging quality, per 100 lb. f.o.b. Pittsburgh. Billets 4 x 4 in. and larger are \$10 per gross ton less than net ton price for bars of same analyses. On smaller than 4 x 4-in. billets down to and including 2½-in. sq. there is a size extra of \$10 per gross ton; on billets smaller than 2½-in. sq., the net ton bar price applies.

*Not S.A.E. specifications, but numbered by manufacturers to conform to S.A.E. system.

FABRICATED STEEL BUSINESS

Orders and Inquiries Are the Lowest in Several Weeks

Awards for the week total about 7600 tons, as compared with 24,000 tons a week ago. The largest award was only 1900 tons. New inquiries call for about 6500 tons, contrasting with approximately 17,000 tons last week.

New York, Westchester & Boston Railroad, station at 132nd Street, New York, 110 tons, to Jones-Smith Co.

Theater at Broadway and Fifty-third Street, New York, 300 tons, to American Bridge Co.

Chesapeake & Ohio Railroad, bridges, 125 tons, to an unnamed fabricator.

New York Central Railroad, bridges, 500 tons, divided among four fabricators.

Highway bridge at Bordentown, N. J., 200 tons, to Phoenix Iron Co.

New Jersey State College, building at New Brunswick, N. J., 300 tons, to American Bridge Co.

George W. Smith & Co., Philadelphia, woodworking plant, 400 tons, to McClintic-Marshall Co.

Union Trust & Savings Bank, Davenport, Iowa, 750 tons, to Mississippi Valley Structural Steel Co.

Sheridan Trust & Savings Bank, Chicago, 1900 tons, to Worden-Allen Co.

Washington State Highway Department, Hamilton, creek bridge, 104 tons, to Illinois Steel Bridge Co.

Okanogan County, Wash., Omak bridge, 217 tons, reinforced concrete construction substituted.

Chicago Gravel Co., Rockdale, Ill., plant, 100 tons, to Milwaukee Bridge Co.

Gas holder at Omaha, Neb., approximately 1100 tons; gas holder at Saratoga, N. Y., 500 tons, to Stacey Mfg. Co.

Packard Electric Co., Warren, Ohio, factory building, 240 tons, reported placed with the Morgan Engineering Co.

Akron Savings & Loan Co., Akron, Ohio, bank building, 750 tons, to the Burger Iron Co.

American Sintering Co., Hubbard, Ohio, 600 tons, to the Variety Iron Works Co. This was previously reported placed with the Penn Bridge Co.

Union Carbide Co., Niagara Falls, N. Y., 200 tons, to Lackawanna Structural Steel Corporation.

Structural Projects Pending

Inquiries for fabricated steel work include the following:

American Car & Foundry Co., addition at Madison, Ill., 300 tons.

Parochial school, Fifty-seventh Street, Brooklyn, 300 tons.

American Gas & Electric Co., New York, power plant for construction in Central West, 2000 tons.

Columbia Machine Works, Brooklyn, 500 tons.

State of South Dakota, bridge at Mobridge, 1100 tons and bridge at Wheeler, 1000 tons.

Vicksburg, Shreveport & Pacific Railroad, New Orleans, bridges, Nos. 168-3 and 34-2, 300 tons.

Cuyahoga County, Cleveland, Hillside Road bridge, 200 tons. New bids asked.

Euclid Avenue Temple, Cleveland, addition, 250 tons, bids taken.

Methodist Church, Piqua, Ohio, 100 tons, bids taken.

Bascule bridge, California Avenue, Chicago, 1200 tons.

Cleveland Union Terminal Co., West Twenty-fifth Street bridge, 250 tons.

Railroad Equipment Business

There is very little in the way of pending business in cars, except a number of inquiries for small lots of passenger cars, previously reported. No formal inquiries have been received by car builders from the Pennsylvania, Chesapeake & Ohio, Norfolk & Western and Nickel Plate roads, which have been expected to come into the market for a total of close to 30,000 freight cars, the reported plans of the Pennsylvania accounting for fully half of that number.

The American Short Line Railroad Association is inquiring for 500 automobile cars.

E. L. Dougherty & Co. has placed 200 tank cars with the General American Tank Car Corporation.

THIRTY-EIGHT IDLE FURNACES

Net Loss of Six in September in Pittsburgh and Adjoining Districts

PITTSBURGH, Oct. 1.—Today, 103 furnaces out of a total of 141 in the territory bounded by Johnstown and Erie, Pa., Dover, Ohio, and Wheeling, W. Va., are making iron, as compared with 109 a month ago, a net loss in September of six furnaces. In the past month the Carnegie Steel Co. put out one Edgar Thomson in the Pittsburgh district and two New Castle furnaces in the Shenango Valley, and the stacks of the Hanna Furnace Co. at Canal Dover, Ohio, the McKeefrey Iron Co. at Leetonia, Ohio, the Reliance Coke & Furnace Co. at Sharpsville, Pa., and A. M. Byers Co. at Girard, Ohio, have ceased production. Only one of the three furnaces of the Shenango Furnace Co., Sharpsville, Pa., is in production, but the furnace of the Sharpsville Furnace Co., Sharpsville, Pa., recently resumed after being idle for about a month because of an accident to the blowing engine. Furnaces carried on the active list number 105, but that total includes two banked furnaces, one Pittsburgh Crucible Steel Co. stack at Midland, Pa., and the furnace of the Struthers Furnace Co., Struthers, Ohio.

Furnaces in and out as of today and a month ago make the following comparison:

PITTSBURGH DISTRICT				
Steel Works Blast Furnaces	Total	Sept. 30	Aug. 31	
American Steel & Wire Co.	4	4	0	4
Carnegie Steel Co.	34	28	6	29
Jones & Laughlin Steel Corporation	12	11	1	11
National Tube Co.	4	4	0	4
Pittsburgh Crucible Steel Co.	2	*2	0	*2
Pittsburgh Steel Co.	2	2	0	2
Merchant Furnace				
Clinton Iron & Steel Co.	1	0	1	0
Total	59	51	8	52
MAHONING AND SHENANGO VALLEYS				
Steel Works Furnaces	Total	Sept. 30	Aug. 31	
Carnegie Steel Co.	15	11	4	13
Republic Iron & Steel	7	4	3	4
Sharon Steel Hoop Co.	1	1	0	1
Trumbull-Cliffs Furnace Co.	1	1	0	1
Youngstown Sheet & Tube Co.	9	6	3	6
Merchant Furnaces				
A. M. Byers	1	0	1	0
Hanna Furnace Co.	3	1	2	2
Reliance Coal & Coke	2	0	2	1
McKeefrey Iron Co.	1	0	1	0
Sharpsville Furnace Co.	1	1	0	*1
Shenango Furnace Co.	3	2	1	2
Struthers Furnace Co.	1	*1	0	*1
Stewart Furnace Co.	1	1	0	1
Valley Mould & Iron Corp.	1	0	1	0
Total	47	29	18	35
WESTERN PENNSYLVANIA				
Steel Works Furnaces	Total	Sept. 30	Aug. 31	
Bethlehem Steel Co., Johnstown	11	7	4	7
Merchant Furnaces				
Adrian Furnace Co.	1	1	0	1
American Manganese Mfg. Co.	2	1	1	1
Kittanning Iron & Steel Mfg. Co.	1	0	1	0
McKinney Steel Co.	3	3	0	3
Perry Furnace Co.	1	1	0	1
Punxsutawney Furnace Co.	1	1	0	1
Total	20	14	6	14
WHEELING DISTRICT				
Steel Works Furnaces	Total	Sept. 30	Aug. 31	
Carnegie Steel Co.	7	5	2	5
National Tube Co.	2	2	0	2
Wheeling Steel Corp.	5	3	2	3
Weirton Steel Co.	1	1	0	1
Total	15	11	4	11
Grand total	141	105	36	112

*One furnace banked.

The Pittsburgh File & Steel Co., 4017-31 Liberty Avenue, Pittsburgh, has been incorporated with capital stock of \$60,000 as a consolidation of the Pittsburgh File & Saw Co., Pittsburgh, and the Akron File Co., Akron, Ohio. New equipment has been installed and the company is operating at full capacity. The new management expects to increase present output and new machinery for that purpose is now being built. An office is maintained also at 1006 Grant Street, Akron.

The Hayes Murphy Co., Hartford, Conn., has been incorporated with capital stock of \$1,000,000 to manufacture textile machinery and parts. L. Hayes Murphy of the American Wiremold Co., Hartford, is president.

NON-FERROUS METALS

The Week's Prices

Cents per Pound for Early Delivery							
Sept.	Copper, New York		Straits Tin	Lead		Zinc	
	Lake	Electro-lytic*	New York	New York	St. Louis	New York	St. Louis
26.....	13.87½	13.25	41.62½	7.05	6.70	6.75	6.40
27.....	13.87½	13.25	41.25	7.05	6.70	6.75	6.40
28.....	13.75	13.25	41.32½	7.05	6.70	6.70	6.35
29.....	13.75	13.25	....	7.05	6.70	6.65	6.30
Oct.							
1.....	13.75	13.12½	42.07½	7.00	6.70	6.65	6.30
2.....	13.75	13.00	41.87½	7.00	6.70	6.65	6.30

*Refinery quotation; delivered price ¼c. higher.

New York

NEW YORK, Oct. 2.

The markets are exceedingly quiet and all of them weak except lead. Copper has again fallen to lower levels on light demand. The tin market is only moderately active, but fairly steady. A fair business is being done in lead with the market a shade easier. Lower quotations are recorded in zinc in a very dull market.

Copper.—The strength which was apparent in the electrolytic copper market last week has given way to marked weakness until today there are offerings at 13.25c. to 13.37½c., delivered, with consumers practically uninterested. Some producers are unwilling to sell at less than 13.37½c., delivered. In the recent moderate buying movement consumers have apparently covered their needs for the present and are awaiting developments. The export market is exceedingly flat, influenced no doubt by European political conditions. Lake copper is quoted at 13.75c., delivered.

Copper Averages.—The average price of Lake copper for the month of September, based on daily quotations in THE IRON AGE, was 13c. The average price of electrolytic copper was 13.36c., refinery, or 13.61c., delivered.

Tin.—The market has been in general quiet with dealers showing no initiative and consumers uninterested. Total sales of Straits tin during the week have amounted to about 700 tons, with about 500 tons of this sold from September 26 to 28, transactions on the latter day having ranged from 41.25c. to 41.37½c. Yesterday 200 tons was sold at a range of 42c. to 42.12c., but today the market has been inactive. Spot Straits tin was quoted today at 41.87½c., New York, with values in the London market reported as £202 for spot standard, £201 7s. 6d. for future standard and £205 for spot Straits, all about £1 per ton lower than a week ago. During the past week the London market declined over £3 per ton, most of which was recovered by yesterday. Deliveries of tin into consumption for the month of September were 4540 tons, with 2362 tons in stock and landing Sept. 30. Imports for September were 4015 tons, bringing the imports for the first nine months to 51,667 tons.

Lead.—While the market is quiet there is a fairly heavy consumption and moderate inquiry. Prices are only steady, with a tendency to shade slightly, as indicated by quotations this week which in the outside market are 6.70c., St. Louis, and 7c., New York, with some sellers asking as high as 7.10c. The quotation of the leading interest continues unchanged at 6.85c., New York.

Zinc.—Demand for prime Western has fallen to very small proportions and the market has declined in the last few days more than for some time. Quotations are about 10 points lower than a week ago with early delivery metal held at 6.30c., St. Louis, or 6.65c., New York, with no interest shown by either domestic or foreign buyers. There has also been a decline of about \$1 per ton in ore prices in the West.

Nickel.—Quotations for shot and ingot nickel are still 29c. to 32c. per lb., with electrolytic nickel held at 32c. by the leading producers. In the outside spot market both shot and ingot nickel are quoted at 29c. to 32c. per lb.

Antimony.—Chinese metal in wholesale lots for early delivery is quoted at 7.50c. to 7.60c., New York, duty paid, for October arrivals.

Aluminum.—Virgin metal, 98 to 99 per cent pure, is quoted by importers at 25c. to 26c. per lb., New York, duty paid, in such cases where they can obtain it from foreign producers. No quotations are made public by the leading domestic producer.

Old Metals.—Prices are a little lower and the market is dull. Dealers' selling prices are as follows:

	Cents Per Lb.
Copper, heavy and crucible.....	13.25
Copper, heavy and wire.....	12.25
Copper, light and bottoms.....	10.75
Heavy machine composition.....	10.50
Brass, heavy.....	7.75
Brass, light.....	6.25
No. 1 red brass or composition turnings..	8.75
No. 1 yellow rod brass turnings.....	7.00
Lead, heavy.....	6.50
Lead, tea.....	5.50
Zinc.....	5.00
Cast aluminum.....	16.75
Sheet aluminum.....	16.75

Chicago

OCT. 2.—Copper and zinc have declined in an exceedingly quiet market. Old metal prices are unchanged. We quote in carload lots, Lake copper, 14.25c.; tin, 43c.; lead, 6.75c.; spelter, 6.35c.; antimony, 9c., in less than carload lots. On old metals we quote copper wire, crucible shapes and copper clips, 11c.; copper bottoms, 9.50c.; red brass, 8.50c.; yellow brass, 6c.; lead pipe, 5.25c.; zinc, 4.25c.; pewter, No. 1, 22c.; tin foil, 30c.; block tin, 35c.; all buying prices for less than carload lots.

Improvement in Operations in the Mahoning Valley

YOUNGSTOWN, Oct. 2.—Attitude of Valley iron and steel makers this week with respect to fall business is somewhat more optimistic. The leading independent interest reports an improvement in the volume of orders coming through the past two weeks, as compared with the average in August and the first two weeks in September. In this district active ingot capacity is being maintained at 85 per cent.

Operating schedules also show some improvement this week. The Falcon Steel Co. has resumed operations at its eight-mill sheet plant in Niles, recently suspended. The Youngstown Sheet & Tube Co. has placed in commission its 12-in. merchant bar mill, idle recently. The Trumbull Steel Co. is operating virtually all units except four tin plate mills. The Falcon Tin Plate Co. is operating its property at Canton at 75 per cent.

Of the 117 sheet mills in the Mahoning Valley, 83 were scheduled this week, which represents the high point in recent schedules. Of 17 tube mills, 16 are rolling.

The Carnegie Steel Co. continues to operate at a rate close to normal, which it has consistently maintained, except for interruptions due to mechanical difficulties.

Coal Gas Plant for Winnipeg

The Winnipeg Electric Railway Co. has placed a contract with the Koppers Co., Pittsburgh, covering the design and erection of a coal gas plant at Winnipeg, Canada. This plant will consist of 17 combination gas ovens of the Becker type having a capacity of 6.8 net tons of coal per charge, together with producer plant and coal and coke handling equipment.

This plant will embody the latest developments in coal gas manufacture, including provision for underfiring the ovens with producer gas, blue gas or oven gas, and steaming of ovens. The ovens are designed to operate on a normal coking time of 12 hr. which can be reduced to 10 hr. or increased as desired, permitting of the greatest flexibility in the production of gas and coke.

This is the third Koppers small oven coal gas plant to be contracted for during 1923. Construction work on the other two plants located at Battle Creek, Mich., and Zilwaukee, Mich., is progressing rapidly and both plants will be in operation before the end of the year.

PERSONAL

A. H. Chamberlain, who has been secretary-treasurer of the American Iron, Steel and Heavy Hardware



A. H. CHAMBERLAIN

Association for nearly eight years, has resigned and on Oct. 1 became general manager of sales of Edgar T. Ward's Sons Co. During Mr. Chamberlain's incumbency the association has increased in membership and strength and he has proved himself a highly capable executive. For a number of years he was connected in an editorial capacity with the hardware department of THE IRON AGE, before that department became a separate paper, *Hardware Age*. In 1908 he accepted an engagement with Wiebusch & Hilger, manu-

facturers' agents, New York, and continued with that company until January, 1916, when he took up his work with the jobbers in iron and steel and heavy hardware. Edgar T. Ward's Sons Co. specializes in shafting, and in cold-finished and special steels, having warehouses in Boston, Newark, Philadelphia, Detroit, Cleveland and Chicago, and Mr. Chamberlain's headquarters will be in Philadelphia. In succession to Mr. Chamberlain the American Iron, Steel and Heavy Hardware Association has elected George F. Greene as its secretary-treasurer. For a number of years Mr. Greene was assistant credit manager of the Midvale Steel & Ordnance Co., at its Philadelphia offices.

Frank Billings, president Tod-Stambaugh Co., Cleveland, and prominent in the Superior iron ore industry, who was taken seriously ill in London a few days ago, has improved rapidly and plans to sail for home this week.

W. E. Colbert, for the past seven years identified with the Pittsburgh Crucible Steel Co. in the operating and sales departments, has severed that connection and joined the sales force of the Schley & Nash Co., Columbia Building, Pittsburgh.

Dr. John A. Mathews, president Crucible Steel Co. of America, New York, and Dr. Richard Moldenke, Watchung, N. J., were the American members of the Iron and Steel Institute in attendance at the Italian meeting, which began with technical sessions at Milan, on Sept. 17 and 18, and continued in a tour, taking in Florence, Rome, Leghorn, Pisa, Genoa, Turin and other centers.

President George G. Crawford of the Tennessee Coal, Iron & Railroad Co., Birmingham, Ala., has returned from a three months' stay in Europe.

A. H. Jameson, formerly with the Bayonne Steel Casting Co., Bayonne, N. J., has been appointed sales manager of the Deemer Steel Casting Co., New Castle, Del., recently taken over by Newlin T. Booth.

A. H. Cordery, one of the veterans of the American steel and iron industry, having been connected with it continuously for 54 years and six months, and all of that time with one company, the Phoenix Iron Co., Philadelphia, has retired from active participation in the company's affairs.

E. J. Schriever, secretary Pollak Steel Co., Cincinnati, for the past four years, has resigned and will engage in the real estate business.

Joel S. Coffin, chairman, and Samuel G. Allen, vice-chairman Lima Locomotive Works; Joseph B. Terbell, president American Brake Shoe & Foundry Co., and F. F. Fitzpatrick, president Railway Steel Spring Co., have been elected to the board of directors of the In-

ternational Combustion Engineering Corporation. Mr. Coffin will be chairman and Mr. Allen vice-chairman of the executive committee.

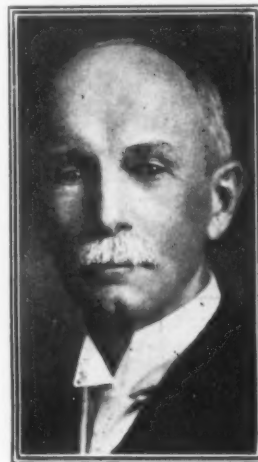
Blake D. Hay, who has been with the Williams Tool Corporation at Erie, Pa., for some time, has been appointed Chicago district manager. He succeeds E. L. Mey, resigned.

Charles M. Brown was elected president of the Colonial Steel Co., Pittsburgh, at the annual meeting held Sept. 24. Herbert C. Poole, who has had charge of the New York office for the last 13 years, was appointed general works manager, and Jacob Trautman, Jr., formerly assistant sales manager, was appointed general sales manager.

Clement A. Hardy, consulting foundry engineer, Chicago, will deliver an address before the Chicago Foundrymen's Club on the evening of Oct. 13, on "Heating, Ventilation and Lighting of the Foundry."

OBITUARY

WILLIAM HENRY BALDWIN, widely known in the steel industry, died at his home in Washington last Wednesday, following a long illness. He was 72 years



W. H. BALDWIN

of age. He served as secretary of the Youngstown Iron & Steel Co. from 1890 to 1892. In the latter year the name of the company was changed to that of Union Iron & Steel Co., which he served with for two years. He then became secretary of the Ohio Steel Co., remaining with the latter from 1894 to 1899. Next he was secretary of the National Steel Co., with which he was identified for two years. Some years after the Steel Corporation was formed, he had a part in the inquiry of the Bureau of Corporations into the cost of making steel. Sub-

sequently he was engaged in social and philanthropic work. Mr. Baldwin also at one time was cashier of the First National Bank of Youngstown. He held this position from 1877 to 1887 and was vice-president of that institution from 1889 to 1900. He received his early education in the public schools of Youngstown and entered Western Reserve College, from which he was graduated in 1871. From 1887 to 1889 he was also vice-president and manager of the Arms-Bell Co., in addition to being vice-president of the First National Bank at Youngstown. He was a member of the Cosmos Club and the Chevy Chase Club of Washington and the University Clubs of Washington and New York. He was also a member of the Phi Beta Kappa and the Alpha Delta Phi Societies. He is survived by a brother, Frank L. Baldwin, of Youngstown, and two sisters, Miss M. Helen Baldwin, Youngstown, and Mrs. Emily B. Osborne of Cleveland.

RUTHERFORD B. BURGHER, president National Drawn Steel Co., East Liverpool, Ohio, died at Dover, Ohio, Sept. 30. He was one of the organizers of the Kidd Drawn Steel Co., Monaca, Pa.

FRANCIS FENWICK, for many years head of Fenwick Freres & Cie., Paris, machinery merchants, died last week of heart failure.

WILLIAM C. AGNEW, pioneer mining engineer in the Lake Superior district, died on Sept. 29 at Duluth, Minn., aged 74 years. He was general manager of the Mahoning Ore & Steel Co. and had been active up to the time of his death. Several years ago, Mr. Agnew was active in the Mahoning valley as railroad civil engineer.

Japan Buys Equipment in United States

Manufactured Products Apparently of Most Interest Now
—Report on Effects of Earthquake—Chilean State
Railways to Issue Rail Tender

NEW YORK, Oct. 2.—The Japanese movement of buying for reconstruction and other purposes has apparently begun in this country in highly manufactured products. An active demand for small electrical equipment and accessories is reported, the General Electric Co. having orders in excess of \$1,000,000, and there is an active interest in motor trucks, of which one large Japanese export house is said to have purchased about 700 available on the Pacific Coast. The heaviest inquiries continue to be for light gage galvanized sheets, No. 8 gage wire and wire nails and a few small requests for prices have been issued on bars and shapes. It seems to be the opinion of some exporters that much of the galvanized sheet business will be placed with British sellers, as a result of the lower prices as well as fairly good delivery. Actual purchasing by the Imperial Government is not yet reported and exporters are awaiting the report of the committee which has been formed to investigate the advisability of forming a Department of Reconstruction through which all purchasing for the devastated areas could be routed. In the meantime there is a persistent rumor that a large Government inquiry for sheets, nails and wire will shortly appear in the American market.

Apparently the prices quoted Japanese buyers on structural material have either been too high or the latter are not yet in a position to place orders. Some of the bar quotations now being made by leading export sellers are reported as \$63.70 per ton, \$64.25 per ton and \$68.75 per ton, all c.i.f. Japanese port. Most of the quotations are now being made c.i.f. Kobe. The only inquiry by any of the large companies in Japan is reported from the Imperial Government Railways for a small lot of axles, wheels and other car equipment.

A number of inquiries, chiefly for wire nails, believed by sellers to be of a highly speculative nature are reported. One of these was for 10,000 kegs and another called for 5000 kegs. On the other hand, an inquiry said to total about 7000 metric tons of wire nails is reported to have come through the Department of Commerce and is considered as authentic business. One exporting and importing company reports the sale of a small tonnage of No. 31 gage black sheets to Japan as well as 2300 tons of wire rods, which have been placed with a Canadian interest. This same exporter for the first time in a number of months has been able to meet British competition on spiegeleisen and booked an order for 1000 tons to a Belgian consumer.

While actual purchasing by Japanese consumers has thus far been small, the number of tentative inquiries for various kinds of material, particularly structural steel for buildings, is apparently large. The H. K. Ferguson Co., Cleveland, reports the receipt of a number of tentative inquiries for reinforcing steel, structural steel and other building equipment to be used in replacing buildings destroyed by the earthquake. This company reports that it was about to begin the erection of additions to the steel plant of the Shibaura Engineering Works at the time of the earthquake and has received word that a large part of this plant was destroyed. Instructions, however, have been given to rush work on the original contract for the additions and additional work for the Shibaura works and an allied company, the Tokio Electrical Works, totaling about 50 per cent of the original contract for the additions, will also be done.

Member of Westinghouse Staff Reports on Earthquake

In a report on conditions between Tokio and Yokohama during the earthquake, F. C. Middleton, of the Westinghouse Electrical International Co. staff in Tokio, where it is represented by Takata & Co., says

that he walked more than 35 miles between the two cities, starting immediately after the first shock. "The Marunouchi building, completed six months ago by the George A. Fuller Co. of the Orient," says Mr. Middleton, "was still standing. Most of the facing brick had been shaken to the sidewalk. Several persons had been killed or injured by these falling pieces. Foreigners reported the inside decorations mostly destroyed. However, owing to its steel skeleton construction, it did not collapse. The Nippon Oil Co. building, immediately adjoining the Marunouchi building, another steel skeleton structure, was still standing, but the second floor was completely wrecked.

"Adjoining the Nippon building there had stood an eight-story reinforced concrete building, without steel skeleton. This had completely collapsed. It is reported that 200 workmen were killed. At Kawasaki," says Mr. Middleton, "the General Electric plant was still intact, except for what I supposed was the main office building, composed chiefly of windows, which had simply fallen inward, so that it was a total wreck." Not far from the plant, Mr. Middleton mentions the river, which during the flood season spreads out about a half mile. "The long steel bridge," he says, "looked like a futurist painting. The various arches were out of alinement. The piers were in some cases raised up, in other cases they had sunk into the river bed. The rails were humped like a camel's back or else twisted until they resembled a snake. However, the ties held them parallel so that an occasional handcar carrying Japanese officials was able to get through."

Chilean Railroads to Inquire for Rails

The annual rail requirement of the Chilean State Railways, with a branch buying office in the United States at 141 Broadway, New York, will be issued about Nov. 1, bids opening in Chile about the end of the month. The tender will specify 14,000 tons of 100-lb. rails, including accessories. The specifications, made up by the Chilean State Railways engineers, are a slight deviation from the standard A. R. A. specifications. Although previous orders have gone to European makers, the present unsettled conditions in Europe, it is believed, may result in the order being placed with American mills this year.

GERMAN IRON AND STEEL ACTIVE

Heavy Stocks on Ruhr May Be Absorbed in Germany—Much Unemployment in Manufacturing Districts

(By Radiogram)

BERLIN, GERMANY, Oct. 1.—Iron and steel market is active. There is good demand for steel in the unoccupied territory, particularly bars and sheets.

The stock of heavy iron and steel on the Ruhr is estimated at 1,750,000 tons, but removal of the export embargo would not materially affect the world market, as Germany will absorb all she can get. Domestic gold prices do not exceed foreign quotations.

Tariff Changes

The Government has put bars, sheets and most other sorts of iron and steel materials on the free list. Export licenses are no longer needed.

Conditions in the iron-consuming manufacturing industries are bad, especially in the Solingen district, where 20,000 are unemployed.

Machinery Markets and News of the Works

SEPTEMBER TRADE POOR

Worst Month of the Year for Machine-Tool Sales Is General Report

Few Large Orders Being Placed Except by Automobile Interests

September brought out the smallest volume of machine-tool buying of any month this year. A slight exception to this was noted in New England in the last half of the month, but generally reports agree that there was little of an encouraging nature during the month. The falling off of railroad buying contributed in no small degree to this situation, though industrial buying also was at very low ebb. One large company

reports that of its sales this year to date 65 per cent have been to the railroads. The general belief is that there will be little more railroad buying of importance this year, but that between now and Jan. 1 budgets will be made up in anticipation of 1924 appropriations.

The automobile companies continue to buy in a fair way. The Ford Motor Co. has bought 16 upsetting machines, the largest order for forging machinery in a considerable time. The Rickenbacker Motor Co., Detroit, bought six lathes. The Chevrolet Motor Co., Detroit, is figuring on a round lot of shop tools but has deferred buying.

The largest buying of the week in the New York market was by the Department of Street Cleaning, New York, which closed for about 10 tools, on which bids were received several weeks ago.

New York

NEW YORK, Oct. 2.

MOST of the machine-tool dealers and special representatives of machine-tool builders report that September was the poorest month of the year in volume of business. One large company states that of its orders this year to date 65 per cent have come from the railroads. Railroad buying has practically ceased, except for the placing of miscellaneous orders for single tools, and no very large expenditures are looked for until next year's appropriations are available. The largest buying of the week was by the Department of Street Cleaning, New York, which gave out orders for about 10 tools, on which bids were received several weeks ago. There were a half dozen engine lathes, a planer, a cold saw, drill presses, etc. The Fruit Growers' Express Co., Washington, D. C., bought a 400-ton wheel press. The Farrell Foundry & Machine Co., Waterbury, Conn., and Buffalo, N. Y., bought an 800-lb. steam hammer, and an order came to an Eastern company for a 36-in. engine lathe from the Illinois Steel Co. The General Electric Co. placed an order for three milling machines.

The Jackwill Mfg. Co., 615 East 134th Street, New York, manufacturer of pipe nipples and kindred products, has engaged Jacob Fisher, 25 Avenue A, architect, to prepare plans for a one-story factory, 75 x 125 ft., on 140th Street, near the Southern Boulevard, estimated to cost \$60,000.

Bids will be received by the Quartermaster Section, United States Army, New York general intermediate depot, Brooklyn, until Oct. 11, for wire screen in rolls, electrical supplies and galvanized iron corrugated roofing, circular 24-248.

The State Government, Constantine, Algeria, will have plans prepared for two hydroelectric generating plants, one at Kreneg, with capacity of 5800 hp., estimated to cost \$1,800,000; and the other at Beni-Haroun, of 2200 hp., to cost approximately \$1,000,000.

The John C. Tilly Ladder Co., 122 Second Street, Watervliet, N. Y., is having plans drawn for a new plant to manufacture metal-reinforced ladders and kindred products, estimated to cost \$50,000, with equipment. William E. Clark, Cannon Building, Troy, N. Y., is architect.

Power equipment, ovens, conveying and other machinery will be installed in the three-story baking plant addition, 75 x 110 ft., to be built by Horn & Hardart Co., 600 West Fiftieth Street, New York, estimated to cost \$200,000.

H. A. Hoffman, care of H. A. Koelble, 114 East Twenty-eighth Street, New York, architect, will commence the erection of a four-story and basement automobile service build-

ing, with machine shop, 100 x 200 ft., on Mount Eden Avenue, to cost \$90,000.

The Guatemala Oil Corporation, Guatemala City, Guatemala, Central America, recently formed with a capital of \$5,000,000, will make early purchases of machinery and electric power equipment for installation at its properties in the northwestern part of Guatemala. The initial development will cost \$500,000 including equipment.

The William F. Kenny Co., 44 East Twenty-third Street, New York, will build a two-story automobile service and repair works, 75 x 200 ft., on Rawson Street, Long Island City, estimated to cost \$80,000. A machine shop will be installed.

Manual training equipment will be installed in the two-story high school to be erected at Hicksville, N. Y., estimated to cost \$200,000, for which bids will be asked on a general contract this month. Coffin & Coffin, 522 Fifth Avenue, New York, are architects; R. D. Kimball, 15 West Thirty-eighth Street, is engineer.

The Royal Eastern Electrical Supply Co., 114 West Twenty-seventh Street, New York, manufacturer of electrical equipment and supplies, has leased a building to be erected on Jackson Avenue, near Harris Avenue, Long Island City, for a new plant.

The Corona Motor Car Sales & Service Co., Jackson Avenue, Corona, L. I., is taking bids on a general contract for the erection of a two-story service and repair building, 110 x 175 ft., on Jackson Avenue, estimated to cost \$50,000.

The Selden Truck Corporation, 238 West Nineteenth Street, New York, manufacturer of motor trucks with plant at Rochester, N. Y., has leased a new one and one-half-story building to be erected on Van Alst Avenue, Long Island City, for a new factory branch. It will be operated in the name of the Selden Sales & Service Corporation of New York.

The Adams Laundry Machinery Co., Troy, N. Y., has purchased property at Kenilworth, N. J., consisting of 25 acres, with main building totaling 100,000 sq. ft. The new owner plans for immediate occupancy. R. N. West is president.

The Board of Education, 22 Valley Road, Montclair, N. J., will receive bids until Oct. 9 for woodworking machinery, including saw table, band saw, etc., for installation in the Nishaune and Hillside junior high schools. Fred P. Reagle is secretary.

The Montclair Ice Co., Pine Street, Montclair, N. J., has awarded a general contract to J. S. Carlson Co., Inc., Walnut Street, for a one-story plant, 125 x 155 ft., estimated to cost \$100,000 with equipment.

The Public Service Electric Co., Public Service Terminal, Newark, N. J., has plans for a one-story power house, 60 x 160 ft., to be erected on Passaic Street. The Public Service Corporation, parent organization, will commence the erection of an addition to its plant at 190-94 Morgan Street, to cost \$72,000.

The Commercial Interchange Corporation, New York, is disposing of the plant of F. C. Mesa, Chancellor Avenue, Irv-

The Crane Market

The crane market continues quiet with few new inquiries noted. Bids were opened Sept. 26, by the Government of the Philippines, 17 Battery Place, New York, on the two 15-ton, and eight 2-ton, semi-portal, revolving jib cranes and also on the six 2-ton, 28-ft. 11-in. span and six 2-ton, 45-ft., 7 $\frac{3}{4}$ -in. span electric overhead cranes, all for the Manila docks. Bids have been forwarded to Manila. Plans call for a total of 48 overhead cranes. The inquiry of the American Smelting & Refining Co., 120 Broadway, New York, has been revised following receipt of bids and new specifications will be issued shortly. The 60-ton overhead crane recently purchased by Viele, Blackwell & Buck, 49 Wall Street for installation in Canada, was awarded to the Northern Engineering Works, Ltd., Walkerville, Ont. Purchase of the 12-ton hand power crane by these engineers has been postponed until a few weeks before it is needed. They are also in the market for a locomotive crane for export. The Norfolk & Western has closed on a locomotive crane with a large builder in the middle West. The International Paper Co., 100 West Forty-second Street is about to place its order for two 15-ton overhead cranes. The American Telephone & Telegraph Co., New York, is said to be receiving bids on used locomotive cranes. It is understood that the Western Electric Co., will purchase its cranes for the new shops in New Jersey in the Chicago district. The list of the General Electric Co., for cranes to be installed at Philadelphia will be issued from Schenectady, N. Y., but probably not for some time. The Griffin Mfg. Co., Erie, Pa., is reported about to close on a 5-ton, 37-ft. span, a 7 $\frac{1}{2}$ -ton, 37-ft. span and a 10-ton, 36-ft. 6-in. span, all 3-motor overhead traveling cranes. The Carnegie Steel Co., Pittsburgh is said to be planning the installation of two additional overhead cranes at the Clairton, Pa., plant.

Among recent purchases are:

Cleveland-Trinidad Co., Flushing, N. Y., a 20-ton locomotive crane with 1 $\frac{1}{2}$ -yd. clamshell bucket from the Brown Hoisting Machinery Co.

Bryden-Neverslip Co., Catasauqua, Pa., a 20-ton locomotive crane from the Brown Hoisting Machinery Co.

Foundation Co., 120 Liberty Street, New York, a 20-ton locomotive crane from the Brown Hoisting Machinery Co.

Safety Insulated Wire & Cable Co., Bayonne, N. J., a 15-ton, 40-ft. boom, locomotive crane from the Browning Co.

Viele, Blackwell & Buck, 49 Wall Street, reported to have purchased a 25-ton, electric driven locomotive crane from the Browning Co.

United Electric Railway Co., Providence, R. I., a 30-ton electric overhead traveling crane from the Northern Engineering Works.

General Electric Co., Schenectady, N. Y., a 15-ton, 40-ft span hand power crane for Brazil, from the Whiting Corporation.

Rockaway Rolling Mills, Rockaway, N. J., through Quackenbush & Sons, Paterson, N. J., a 5-ton, single I-beam hand power crane of the Chisholm-Moore Mfg. Co.

Vermont Marble Co., Proctor, Vt., three 2-ton, single I-beam hand power cranes from the Chisholm-Moore Mfg. Co.

Atlantic Marble Co., Brooklyn, N. Y., a 5-ton single I-beam hand power crane from the Chisholm-Moore Mfg. Co.

Koppers Co., Pittsburgh, a 5-ton, 80-ft. span, bucket handling crane for by-product plant at the Lackawanna works, Buffalo, from the Morgan Engineering Co.

Pennsylvania Railroad, a 5-ton 46-ft. span asphalt crane with $\frac{3}{4}$ -cu. yd. bucket for Olean, N. Y., from the Northern Engineering Works.

Western Plumbing & Supply Co., Chicago, a 5-ton electric cage control monorail hoist from the Detroit Hoist & Machine Co.

Frick Co., Waynesboro, Pa., two 5-ton jib cranes from the Whiting Corporation.

Union Pacific Railroad Co., Omaha, Neb., a 5-ton, self-supporting jib crane from the Whiting Corporation.

Virginia Power Co., Charleston, W. Va., a 100-ton, double trolley, electric traveling crane from the Whiting Corporation.

Aurora, Elgin & Chicago Railroad, a 15-ton hand power crane from the Whiting Corporation.

Western United Corporation, Aurora, Ill., a 20-ton hand power crane from the Whiting Corporation.

Chicago, Wilmington & Franklin Coal Co., Chicago, a 25-ton hand power crane from the Whiting Corporation.

Belle City Malleable Iron Co., Racine, Wis., a 5-ton, 34-ft. span, 3-motor, overhead traveling crane from the Milwaukee Electric Crane & Mfg. Co.

ington, N. J., previously used for ammunition manufacture, recently acquired from the receiver. The main section has been purchased by the Phoenix Brass Foundry, Inc., 861 Springfield Avenue, size 200 x 300 ft., for a new plant. Another portion has been sold to the American Abrasive Metals Co., with works on adjoining site, to be used for expansion.

The Newark-Flint Corporation, 493 Broad Street, Newark, local branch of the Flint Motor Co., Flint, Mich., is taking bids for a one-story service and repair building, 75 x 185 ft., at 1016-18 South Broad Street, to cost \$60,000. W. C. Durant is president. G. W. Backoff, Chamber of Commerce Building, is architect.

Manual training equipment, steam power plant apparatus, etc., will be installed in the new high school to be erected at Clifton, N. J., estimated to cost \$150,000, for which bids will be received on a general contract until Oct. 16. Lee & Hewitt, 152 Market Street, Paterson, N. J., are architects and engineers.

The Cook Electric Co., 360-64 Jelliff Avenue, Newark, manufacturer of electrical equipment, is completing plans for a two-story addition, 75 x 95 ft., to cost \$40,000. S. S. Cook is head.

The Borough Council, Lavallette, N. J., plans the installation of electrically-operated pumping machinery in connection with a municipal waterworks estimated to cost \$80,000. Sherman & Sleeper, 501 Cooper Street, Camden, N. J., are engineers.

The Gas-Kut Corporation, Newark, recently organized, has leased a portion of the building of the Foster Screen Co., 161-69 Ogden Street, for the establishment of a new plant to manufacture gas-burning devices and equipment. Harry Viet is one of the heads of the company.

Manual training equipment will be installed in the new junior and senior high school to be erected on Main Street, Madison, N. J., estimated to cost \$200,000, for which bids are being taken on a general contract until Oct. 23. Guilbert & Betelle, Chamber of Commerce Building, Newark, are architects.

The American Bottle Cap Co. of New York, Inc., 110 West

Fortieth Street, New York, has been incorporated with capital stock of \$250,000 as a subsidiary of the parent company, Seattle, Wash., manufacturer of bottle caps and metal products. The Eastern plant will be located at Bridgeport, Conn., where a building has been secured. Machinery and equipment will be needed soon, including special machinery. It is stated that orders on hand will keep the plant going day and night for several months. E. J. Dupree is president; J. A. Dupree, vice-president and W. E. Rivard, secretary-treasurer.

Krauter & Co., 583 Eighteenth Avenue, Newark, is inquiring for a 7000- to 10,000-gal. steel tank for fuel oil storage.

The Holley Mfg. Co., 181 South Street, Newark, recently organized with \$50,000 capital stock, will manufacture electrical devices. E. D. Holley is president.

The Starr-Rawlings-Dickey Corporation, 501 Fifth Avenue, New York, manufacturers' agent for belting, machinery and mill supplies, has established an office in the Vizoso Building, Havana, Cuba, under the management of René M. Droeshout and is interested in representing other manufacturers on an exclusive basis.

Catalogs Requested

Roku-Roku Shoten, Ltd., a Japanese machinery importer, has advised THE IRON AGE that its head offices in Tokio were totally destroyed in the earthquake and has established offices on the Enokojima Nishiku, Osaka, and also temporary offices in Tokio at 30 Takanawa Minamicho, Shiba. Catalogs and price lists of machine tools and allied equipment are desired to replace those destroyed in the earthquake.

Export Opportunity

Ramdhan & Sons, Jullundur City, India, have advised correspondents in this country that they are in the market for the following: One drilling machine, one polishing machine, one 10-hp. oiler, 10 tons of zinc and lead, and 10 tons of brass soft sheets, brass tubes and bars. The brass tubes and bars are for making cooking utensils.

New England

Boston, Oct. 1.

DESPITE the rather discouraging conditions of the first half of the month, the machine tool business shows improvement of about 10 per cent with most dealers for the entire month of September. The last week has been particularly encouraging, giving reason to believe that October business will be more satisfactory. The more liberal attitude of the banks is credited with contributing to this improvement. Although there have been no large transactions in the last two weeks, the following sales, mentioned by one firm, indicate that some business is being done. One buyer bought a lathe, planer and shaper at a cost of about \$7,000; another bought a 36-in. lathe; another two power presses, and high speed hammers and upright drilling machines are also included in the transactions. Improvement is also noticeable in demand for second-hand machine tools.

The Chelsea High School, to be erected in Chelsea, Mass., on which bids will close Oct. 3, will cost about \$700,000. manual training and machine shop equipment will be installed. The architect is S. S. Eisenberg, 46 Cornhill, Boston.

Plans are in progress by the Boston Trade School, Boston, of which McLaughlin & Burr, 88 Tremont Street, Boston, are the architects.

Plans have been filed by Lander, Frary & Clark, Stanley Street, New Britain, Conn., for the erection of an addition to cost \$30,000.

Manual training equipment will be installed in the new high school to be erected at Franklin, Mass., estimated to cost \$125,000, for which Ritchie, Parsons & Taylor, 15 Ashburton Street, Boston, are architects.

Fire, Sept. 25, destroyed a portion of the plant of the Tribble Cordage Co., Union Street, Woburn, Mass., with loss estimated at \$100,000 including equipment. It is planned to rebuild.

Dixon & Fallis, Cambridge, Mass., manufacturers of mechanical patterns, etc., have inquiries out for screw-cutting lathe, 26 in. swing, with 12 ft. bed.

The Underwood Machinery Co., Boston, recently organized with a capital of \$100,000, will take over and expand the plant and business of the company of the same name, with works at 110 Mount Vernon Street, South Boston. Frank E. Underwood is president and treasurer, and William K. Underwood, vice-president.

The plant and property of the Belcher & Taylor Agricultural Tool Co., Chicopee Falls, Mass., has been acquired by new interests. Plans are under way for a reorganization and extensions in the plant.

The J. H. Wisbach Co., 1123 Commonwealth Avenue, Boston, manufacturer of automobile bodies, is said to be preparing a list of equipment for installation in its proposed plant on North Beacon Street.

The Torrington Electric Co., Torrington, Conn., has acquired 100 acres in the Winchester section, and contemplate extensions in its hydroelectric generating plants.

The Common Council, Uxbridge, Mass., is planning the installation of electrically-operated pumping machinery at a proposed plant for the municipal waterworks. Barbour & Dixon, 73 Tremont Street, Boston, are engineers.

Superstructure work is under way on the new one-story and basement addition, 75 x 100 ft., of the Gillette Safety Razor Co., Dorchester Avenue and West First Street, South Boston, exclusively for the manufacture of razor blades. It will cost \$200,000 with machinery. Charles T. Main, 48 Federal Street, Boston, is engineer.

The McCulloch Mfg. Co., 216 High Street, Boston, manufacturer of machinery and parts, is planning for enlargements to include the installation of a shaper, lathe, drill press and other tools.

The Connecticut Power Co., New Haven, Conn., is planning for additions in its generating plant at Middletown, Conn., and the installation of new machinery. It will expend about \$500,000 during the present year on this and other work, including additional transmission lines.

The Radio Equipment Co., Boston, has leased the five-story and basement building at 18-20 Stuart Street for a new plant.

The Norma Co. of America has placed contracts for the erection of the first unit of its new plant upon 17 acres of land recently acquired at Stamford, Conn., facing the main tracks of the New York, New Haven & Hart-

ford Railroad adjacent to Glenbrook Station. The buildings under construction will be of one story, saw-tooth roof type and will occupy about 60,000 sq. ft. The company's present plant at Anable Avenue, Long Island City, will be continued for the production of Norma precision open type annular ball bearings. The Stamford plant will be equipped for the manufacture of Hoffmann precision roller bearings, the American rights to which, as well as to all other Hoffmann products, were recently acquired from the Hoffmann Mfg. Co., Ltd., Chelmsford Essex, England. The plant will also be equipped for expansion of the manufacture of Norma precision ball bearings.

The Lally Column Co., Cambridge 39, Mass., is in the market for a gate shear of capacity to handle 1 1/4-in. x 16-in. material, and at least 30 in. between housings.

John W. Bolton & Sons, Inc., Lawrence, Mass., is inquiring for a 150 or 200-hp. induction motor, three-phase, 60-cycle, 220 volts a.c.

Philadelphia

PHILADELPHIA, Oct. 1.

CONTRACT has been let by the Keystone Card Index Co., Philadelphia, to the Smith-Hardican Co., 1800 Callowhill Street, for a new plant at Natrona and Race Streets, estimated to cost \$55,000, including equipment. H. B. Weldon, Fuller Building, is architect.

The Willys-Overland Co., Toledo, Ohio, has leased the plant of the George W. Smith Co., Inc., Forty-ninth Street and Botanic Avenue, Philadelphia, for a new assembling works for Overland and Willys-Knight automobiles. Extensions will be made to provide for an initial output of 200 cars per day. Work will commence early in January. The Smith company, operating a woodworking plant, has construction under way on a new factory.

The Bureau of Supplies and Accounts, Navy Department, Washington, will take bids until Oct. 16, for 4000 steel bolts for the Philadelphia Navy Yard, schedule 1356.

The North Philadelphia Supply Co., Inc., 3233 Germantown Avenue, Philadelphia, pipe, plumbing equipment, etc., will erect a three-story building to cost \$22,000. J. W. Thompson, 703 South Sixtieth Street, is architect.

The Gorgas-Pierie Mfg. Co., 144 East Allen Street, Philadelphia, manufacturer of oil products, will remodel the plant of the American Agricultural Chemical Co., Delaware Avenue, recently acquired, and install additional machinery.

The Sun Shipbuilding & Drydock Co., Chester, Pa., is perfecting arrangements for the installation of a 10,000-ton drydock, with additional equipment for ship construction and repair work. J. N. Pew is president.

The City Council, Philadelphia, has granted an appropriation of \$6,000,000 to the Bureau of Water, for extensions and improvements in the municipal water plants and system, including the installation of new electrically-operated pumping machinery. The bureau is developing plans for a large project for additional water supply to involve more than \$30,000,000, to include the construction of a power house and electrically-operated pumping plant in the vicinity of Yardley on the Delaware River, with capacity of 600,000,000 gal. per day.

Fire, Sept. 25, at the coal pockets of the George B. Newton Coal Co., Fifty-third Street and Thomas Avenue, Philadelphia, destroyed coal-handling and conveying equipment and other property, with loss estimated at \$50,000. It is planned to rebuild.

Foundations are being laid for the initial buildings for the new plant of the General Electric Co., Witherspoon Building, Philadelphia, at Sixty-ninth Street and Elmwood Avenue, estimated to cost \$5,000,000 with machinery. It will be used primarily for electric switchboard manufacture.

The Board of Education, Atlantic City, N. J., will commence the construction of a four-story and basement addition to its vocational school at Surf Place, 32 x 116 ft., for which H. A. Stout, Guarantee Trust Building, architect, has prepared plans. A three-story extension, 42 x 125 ft., will also be erected to the industrial school at Indiana and Baltic Avenues, Bertram Ireland, Guarantee Trust Building, is architect for the latter structure.

The Borough Council, Ephrata, Pa., is arranging a bond issue of \$50,000, the proceeds to be used for the construction of a municipal electric power plant.

Manual training equipment will be installed in the new high school to be erected at Palmerton, Pa., estimated to cost \$300,000, for which bids will soon be asked on a general contract. The New Jersey Zinc Co., has given \$150,000 toward the project. The Board of Education is in charge.

Arrangements are being made for the sale of the plant and equipment of the Lehigh Machine Co., Lehigh, Pa., operated by the National Automatic Machine Co.

A machine shop will be installed in the two-story automobile service building, 90 x 120 ft., to be erected by Walter T. Matthews, Paoli, Pa., for which plans are being prepared by Philip S. Tyre, 1509 Arch Street, Philadelphia.

M. S. Kemmerer & Co., Sandy Run, Pa., are planning the construction of a new coal washery at their properties, estimated to cost \$50,000 including machinery. Work is under way on extensions in the coal breaker.

The Metropolitan-Royalton Electric Co., Royalton, Pa., is being organized by officials of the Metropolitan Edison Co., Reading, Pa., to establish a local power plant and system. Hause, Evans & Baker, Harrisburg, Pa., represent the company.

The Candelmas Coal Co., Silver Brook, near Hazleton, Pa., is planning for the installation of machinery at its coal properties, including electric power equipment, hoisting, mining machinery, etc.

In connection with extensions at its plant, the Bryden Horseshoe Co., Catasauqua, Pa., is arranging for the complete electrification of the works, superseding present steam operation. Contract has been let to F. B. Glassmire, Bethlehem, Pa., for a new horseshoe mill unit, with a new rough down mill adjoining. A new gas producer plant will be installed, with two new gas furnaces in the billet department. Machinery from the plant of the Neverslip Mfg. Co., New Brunswick, N. J., recently removed to the local works, will be utilized and considerable additional equipment installed.

The Harrisburg Motors, Inc., Harrisburg, Pa., recently organized under Delaware laws with a capital of \$100,000, will act as local representative for the Packard automobile, and will operate a complete machine and repair shop at 1344 Howard Street. H. R. Hamilton is general manager, and Ralph S. Hesser, associate general manager.

The Ulster, Sheshequin and Smithfield Township Electric companies have been organized by O. L. Haverly, Athens, Pa., and associates, to establish power plants and systems in the respective districts for which named. Mr. Haverly will head the companies.

A machine shop will be installed in the two-story automobile service building to be erected at West King and Charlotte Streets, Lancaster, Pa., by John B. Bissinger, 323 Lime Street, estimated to cost \$60,000.

The B. B. T. Corporation of America, 810 Atlantic Building, Philadelphia, recently incorporated, will act as American distributors for the products of Barbier, Benard & Turenne of Paris, France, manufacturers of special lighting equipment. Material is at present being imported from the main factory in France, but plans are under way for manufacturing certain parts in this country. W. W. Kellett is secretary-treasurer.

Pittsburgh

PITTSBURGH, Oct. 1.

MACHINE tool business in this territory has suffered a sharp decline the past week, and September, which at its outset gave promise of being a good month in the matter of orders, will prove one of the leanest of the year with most of the trade. The conservatism which has developed among users of steel appears to be spreading into the machine tool buying channels and much of the hopeful feeling which existed in the trade at the beginning of September has disappeared. Business in cranes and other heavy equipment also has been quiet in the past week.

The mills for the East Ohio Mfg. Co., Warren, Ohio, which is fitting up a plant for the manufacture of cold-rolled strip steel, were awarded last week. The order was divided between the United Engineering & Foundry Co., Pittsburgh, and Blake & Johnson, Waterbury, Conn. The latter will furnish four 8-in. mills, together with recoilers, automatic cutting machine and other auxiliary equipment, and the United Engineering & Foundry Co. was awarded two 12-in. and two 10-in. mills with accessory equipment. Barton R. Shover, Oliver Building, Pittsburgh, is consulting engineer for the East Ohio Mfg. Co.

The Diamond Alkali Co., First National Bank Building, Pittsburgh, recently placed the steel for an extension for its plant at Painesville, Ohio and is inquiring for tools.

Negotiations have been concluded by the Aetna Foundry & Machine Co., Warren, Ohio, for the purchase of the plant and equipment of the Shenango Foundry Co., Sharon, Pa., possession to be effective Oct. 1. The new owner will make improvements and operate as a branch plant.

The Pittsburgh Malleable Iron Co., Thirty-fourth and Smallman Streets, Pittsburgh, has awarded a general contract to Conley & De Mey, 127 North Highland Avenue, for a one-story addition, 95 x 260 ft., estimated to cost \$55,000.

Robert Talbott & Co., Fairmont, W. Va., operating coal properties in Monongalia County, are planning the construction of a new tippie. Additional shaker screen equipment, electric power and other machinery will also be installed.

The Penn Public Service Co., Johnstown, Pa., will issue stock for \$100,000, the proceeds to be used for extensions and equipment during the year.

The Hupmobile Motor Co., Huntington, W. Va., will install a machine and repair shop in its new local service building, comprising two one-story structures, 90 x 106 ft., and 30 x 90 ft.

The John Eichleay, Jr., Co., Oliver Building, Pittsburgh, operating a marine and shipyard works, structural steel plant, etc., has preliminary plans for a new six-story and basement building at Twenty-first and Wharton Streets, estimated to cost \$650,000 with equipment. James P. Piper and Henry M. Kropff, 2237 Oliver Building, are engineers.

The Flow Gas Alarm Mfg. Co., Morgantown, W. Va., recently organized, plans for the establishment of a factory to manufacture alarm devices and equipment. J. S. Facenda, Mona, W. Va., heads the company.

The Warwood Tool Co., Wheeling, W. Va., will commence the erection of a one-story addition to its machine shop, 42 x 85 ft.

A machine shop will be installed in the new two-story automobile service building, 52 x 100 ft., to be erected by W. B. Holmes, Jr., Clearfield, Pa., estimated to cost \$45,000.

The West Penn Power Co., West Penn Building, Pittsburgh, has arranged for a capital stock issue of \$1,500,000, the entire proceeds to be used for extensions in electric generating plants and system and the installation of additional equipment.

The Killarney Smokeless Coal Co., Lynchburg, Va., James Gorman, president, recently organized with a capital of \$1,000,000, is planning for the installation of electric power and mining machinery on properties near Killarney, W. Va.

The Grotz Mould & Machine Works, Wellsburg, W. Va., manufacturer of glassworking machinery, plans the installation of additional equipment, including one back-gear shaper, two engine lathes, cylinder grinding machine and other tools. H. S. Grotz is head.

Manual training equipment will be installed in the new two-story and basement high school to be erected at Ridgeway, Pa., estimated to cost \$160,000, for which foundations will be laid at once. Maurice E. Kressler & Co., Harrisburg, Pa., is architect.

The Kane Mfg. Co., Kane, Pa., manufacturer of wire goods, has awarded a general contract to E. E. Austin & Son, Erie, Pa., for a two-story addition, 40 x 80 ft., to cost \$33,000.

The Griffin Mfg. Co., Erie, Pa., has completed the purchase of a factory, a portion of which will be used for storage and the remainder for manufacturing purposes. Equipment consisting mainly of traveling cranes is needed. J. C. Griffin is president.

Buffalo

BUFFALO, Oct. 1.

PRELIMINARY plans are under consideration by the Ford Motor Co., Highland Park, Mich., for a new assembling plant on a 40-acre tract at Buffalo, to supersede the present works at Main and Rodney Streets, which have been outgrown. Locations are under advisement on Hertel Avenue, as well as in the Tonawanda section. It will cost in excess of \$500,000 with machinery.

The Board of Education, 1400 Telephone Building, Buffalo, D. J. Sweeney, deputy superintendent of business and accounts, will take bids until Oct. 8 for vocational equipment for various public schools.

The Common Council, Canandaigua, N. Y., is considering the installation of a municipal electric power plant, and electrically-operated pumping machinery for the waterworks. Estimates of the cost will be secured by Henry A. Beeman, president Board of Public Works.

P. A. Dunn, 647 East Ferry Street, Buffalo, is planning the establishing of a new factory to manufacture small machine parts for automobiles.

The Tonawanda Power Co., North Tonawanda, N. Y., has acquired a site at Main and Sommer Streets for a new power house.

The Trico Products Co., Ellicott Street, Buffalo, manufacturer of automobile equipment, metal stampings, etc., has plans for an addition to cost \$100,000 including equipment.

The International Time Recorder Co., Endicott, N. Y., manufacturer of factory time clocks, etc., is reported to be planning for enlargements.

The Buffalo General Electric Co., Electric Building, Buffalo, has plans for a new generating plant at Hamburg Pike and Childs Street.

The Premier Mill Corporation, Geneva, N. Y., recently organized with a capital of \$200,000, is planning the installation of equipment in a local building to manufacture grinding apparatus. S. K. Nester, one of the heads of the company will do the purchasing.

J. A. Cramer, 1010 Main Street, Buffalo, will commence the erection of a three-story addition to his automobile service and repair works, 50 x 130 ft., at 173-77 Pearl Street, to cost \$65,000. A. H. Hopkins, 447 Main Street, is architect.

A machine and repair shop will be installed in the new two-story automobile service and repair building, 42 x 110 ft., to be erected by John A. Markett, 157 West Tupper Street, Buffalo.

The S. M. Ryder Mfg. Co., Niagara Falls, N. Y., manufacturer of capping machinery, etc., is planning to rebuild the portion of its factory recently destroyed by fire, and will install additional equipment. S. M. Ryder is head.

The Sommers-Farnsworth Motors, Inc., Clifton Springs, N. Y., is planning for the installation of tools and other equipment for an automobile service and repair department. D. F. Sommers is head.

The General Railway Signal Co., Rochester, N. Y., and the Federal Signal Co., Albany, N. Y., have been consolidated, and the business will be continued under the name of the former company and manufacturing operations will be concentrated at Rochester and the equipment of the Federal company will be moved there.

Baltimore

BALTIMORE, OCT. 1.

THE plant of the Maryland Metal Products Co., Hagerstown, Md., has been acquired at auction by the Poole Engineering & Machine Co., Baltimore, for \$160,000. The Poole company used the plant during the war to fill contracts and owned 50 per cent of the bonds of the company. Plans for the future use of the works have not been formulated.

The Baltimore Copper Smelting & Rolling Co., Canton, Baltimore, has acquired the adjoining property, formerly occupied by the Canton Distillery, for \$110,000. It will be held for possible future expansion but no plans are being made for extensions at present.

The Baltimore, Chesapeake & Atlantic Railway Co., Pier 1, Pratt Street, Baltimore, will erect a one-story machine shop at Pratt and South Streets.

John C. Easley, Lynchburg, Va., is planning to contract for the manufacture of electric switching equipment, encased in metal casting box, for automobiles and is desirous of getting in touch with metal-working plants in position to handle the work.

The Harrison Automobile Radiator Co., 400 North Henry Street, Richmond, Va., has inquiries out for a lathe, drill press and other equipment.

The General Purchasing Officer, Panama Canal, Washington, will take bids until Oct. 8 for equipment for the Canal Zone, including steel drill rods; 9000 ft. plow steel hoisting rope; 2000 ft. iron or steel rope, $\frac{3}{4}$ in. diameter; barbed wire, spring wire, etc., circular 1559; until Oct. 10 for 16 drill chucks; 500 ft. of chain; 6 scales; nickel chrome steel pinions; wire; brass tubing; etc., circular 2334.

The Columbus Brick & Tile Co., Columbus, Ga., has acquired 225 acres and plans for extensions and the installation of electric power and other machinery.

The Board of Education, Macon, Ga., will build a one-story vocational shop, 25 x 122 ft., in connection with a new three-story high school estimated to cost \$350,000, for which foundations will soon be laid. A list of equipment to be installed will be advertised in the near future. C. H. Bruce is superintendent.

The Rhodolite Co. of New York, Inc., recently organized by Warren R. Palmer, 149 Broadway, New York, and associates, has leased the abrasive properties of the Carolina Abrasives Co., near Willits, N. C., and plans the installation of machinery for development and operation, including electric power equipment. It is purposed to purchase and assemble the equipment in New York, and remove as a unit to the plant. R. S. Perry is directing engineer.

The Hatfield Resilient Wheel Co., Munsey Building, Baltimore, Schuyler C. Hatfield, head, is planning the construction of a new two-story factory 50 x 150 ft., to manufacture special automobile wheels. Metal-working and wood-working machinery will be installed.

The Bureau of Supplies and Accounts, Navy Department, Washington, will take bids until Oct. 16 for 19,350 sq. ft. of copper wire cloth, for the Hampton Roads and Norfolk Navy

Yard, schedule 1360; until Oct. 23 for 4000 ft. of electric wire for the Mare Island Navy Yard, schedule 1357.

The Atlantic Coast Line Railway Co., Wilmington, N. C., is taking bids on a general contract for its new car construction and repair shops at Rocky Mount, N. C., to cost \$90,000 with equipment.

Fire, Sept. 23, destroyed the three-story plant of the J. Elwood Cox Mfg. Co., High Point, N. C., manufacturer of bobbins and other textile mill equipment, with loss estimated at \$100,000 including equipment. It is planned to rebuild.

The Pyramid Motor Co., 403 North Tyron Street, Charlotte, N. C., will install a machine and repair shop at its proposed service building at East Avenue and North Davidson Street, 140 x 200 ft., for which plans will soon be prepared. Frederick Anderson is general manager.

The Fairfax Pink Granite Co., Inc., 21 Chain Bridge Road, Cherrydale, Va., recently organized with a capital of \$50,000, has tentative plans for the installation of a new crushing plant, electrically-operated; electric power equipment and other apparatus. John T. Mallon is president and manager.

The Hackley Morrison Co., 1708 Lewis Street, Richmond, Va., machinery dealer, has inquiries out for an electric hoist, 10 to 12-hp., also, for one well-drilling machine, and a gasoline locomotive, Plymouth type.

The Chief of Engineers, Room 2825 Munitions Building, Washington, will take bids until Oct. 16, for 25 ventilating blowers, complete with motors and starting regulators, advertisement 24-120.

The Victory Mining Co., Oakland, Md., recently organized with a capital of \$500,000, is planning the installation of electric power equipment, hoisting and mining machinery on local properties. G. S. Hamill heads the company.

Electric traveling cranes, hoisting, conveying and other machinery will be installed at the new piers and warehouses to be erected by the Western Maryland Railroad Co., Baltimore, at the McComas Street terminal, estimated to cost \$3,000,000.

The Rockingham Paper Co., Rockingham, N. C., recently organized, is planning the erection of a new mill, 80 x 200 ft., with a daily capacity of about 10 tons. A power house will also be built. H. C. Wall is president and E. L. McCall, secretary and treasurer.

The Virginia Fuel Corporation, Portsmouth, Va., recently organized, is perfecting plans for new works at Norfolk, Va., to manufacture fuel briquettes. Machinery will be electrically-operated. A power house is also planned. S. W. Williamson is general manager.

The Common Council, Goldsboro, N. C., plans the installation of electrically-operated pumping machinery in connection with extensions in the municipal waterworks, estimated to cost \$60,000.

Detroit

DETROIT, OCT. 1.

WORK will commence on a two-story addition to the plant of the Rickenbacker Motor Co., 4815 Cabot Street, Detroit, estimated to cost \$75,000, for which a general contract has been awarded to F. J. Winter, 2331 Dime Bank Building.

The Common Council, Grand Haven, Mich., has completed plans for a one-story municipal electric light and power plant to cost \$80,000. A. C. Stark, 1151 Columbus Avenue, is architect.

The Detroit Aero Metals Co., 657 Lycaete Avenue, Detroit, recently organized, is having plans drawn for six one-story units, each 60 x 260 ft., to cost \$200,000 with equipment. J. E. Thompson is president.

The Reo Motor Car Co., Lansing, Mich., has excavations under way for an addition to its power plant to double the capacity. Work is in progress on other additions to the automobile buildings.

The Nizer Laboratories Co., 3345 Grand River Boulevard, Detroit, manufacturer of refrigerating equipment, cabinets, etc., a subsidiary of the Arctic Ice Cream Co., Detroit, has acquired the plant of the Commerce Motor Car Co., 7424 Mackle Street, with buildings totaling about two acres of space. The new owner will use the property as a new plant for its regular line of manufacture.

Frank Bromley, 2642 East Grand Boulevard, Detroit, is considering plans for a new one-story foundry at Hamtramack, estimated to cost \$25,000.

The General Cabinet Co., Battle Creek, Mich., recently organized, has leased the Buck Building, Barney Street, and will install equipment for the manufacture of radio cabinets and kindred products. Clyde D. Buck heads the company.

The Detroit Torch & Mfg. Co., 12141 Cardoni Avenue, Detroit, is said to be arranging a list of machine shop and other equipment at its plant for increased output. It manufactures brass products.

The Michigan Central Railroad Co., Detroit, has awarded a general contract to the Ellington Miller Co., 417 South Dearborn Street, Chicago, for a new engine house and shop at Grand Rapids, Mich., estimated to cost \$65,000.

The Cadillac Motor Car Co., 2860 Clark Street, Detroit, has filed plans for a one-story addition to cost \$75,000.

Manual training equipment will be installed in the new two-story and basement junior high school addition to be erected at Royal Oak, Mich., estimated to cost \$150,000, for which foundations will soon be laid. Frederick Madison, 212 First State Bank Building, is architect.

The Buhl Stamping Co., 2730 Scotten Street, Detroit, manufacturer of stamped metal products, will build a two-story addition to cost \$30,000.

The Kalamazoo Sanitary Mfg. Co., Kalamazoo, Mich., is planning the erection of an addition, 275 x 500 ft., to cost \$350,000 including machinery.

The Martin-Parry Corporation, 6201 Woodward Avenue, Detroit, manufacturer of automobile bodies, with headquarters at York, Pa., has leased a portion of the former plant of the Milburn Electric Co., Toledo, Ohio, manufacturer of electric automobiles, for branch works.

The M. Mitskun Co., Detroit, is looking for several steel buildings suitable for reconstruction.

The Homer Engineering Co., Canton, Ohio, is adding equipment to its plant, more than doubling its present capacity. In addition to increasing its motor machine shop equipment, it is installing machinery for the operation of a general manufacturing and sheet metal specialty department.

The Wheeling Match Co., Wheeling, W. Va., has taken the bids for an extension, 100 x 200 ft.

The City Ice & Fuel Co., Cleveland, will erect a 100-ton ice manufacturing plant and enlarge another from 75 to 130 tons daily capacity. It will also erect an 80-ton plant and a storage building at Mason City, Ill., and is planning extensions to its plants in Columbus and Cincinnati, Ohio.

The Philips Body Co. has purchased a factory in Warren, Ohio, formerly occupied by the National Lamp Works, which it plans to equip for manufacturing purposes.

The White Motor Co., Cleveland, has taken an order for 500 taxicabs for the Quaker City Cab Co., Philadelphia, amounting approximately to \$1,750,000.

The Cambridge Steel Products Co., Cambridge, Ohio, is in the market for a straightening machine for light rails up to 40 lb.

The Roxana Petroleum Co., Lima, Ohio, has tentative plans for new works to manufacture lubricating oils, estimated to cost \$300,000 with machinery.

The Ohio Power Co., Canton, Ohio, is disposing of a bond issue of \$6,000,000, the proceeds to be used for the construction of a generating plant at Philo, Ohio, with initial output of 70,000 kw., with new transmission lines.

Cleveland

CLEVELAND, Oct. 1.

BUSINESS continues rather dull with dealers and sales are mostly in single machines. Among orders placed during the week was one for four 15-in. motor-driven lathes, which were purchased by the Wilson Transit Co. to be installed on lake boats for repair work. A tendency is noted among lake transportation companies to add to equipment for repairing boats which do not necessitate taking into a shipyard or dry dock.

Orders and inquiries for automatic screw machines show improvement, but with a number of machine tool builders orders have fallen off and September business was disappointing.

The Ford Motor Co. has purchased 14 4-in. and two 3½-in. upsetting machines from a Cleveland manufacturer. This is the largest order for forging machinery placed in a long time. The Rickenbacker Motor Co., Detroit, has an inquiry out for 6 lathes and is expected to buy considerable other equipment. The Chevrolet Motor Co., Detroit, is figuring on the purchase of a round lot of machinery but has deferred buying temporarily.

Plans for the reorganization of the Universal Crane Co., Elyria, Ohio, have been completed and the company has passed to the controlling interests of the Threw Shovel Co., Lorain, Ohio. A new corporation under the same name will be formed and \$200,000 in prior preferred stock and 20,000 shares of a total of 30,000 shares of no par common stock will be taken by the Threw interests. The old stockholders of the Universal Crane Co. will exchange their stock for \$275,000 in new preferred and will also have 10,000 shares of the no par common stock. F. A. Smythe, president Threw Shovel Co., will probably be president of the reorganized company, and David L. Johnson, the present secretary, will remain in the same capacity. The new financing will provide additional working capital and funds for adding new equipment. Some additional equipment will be purchased shortly.

The Gabriel Mfg. Co., Cleveland, makers of shock absorbers for automobiles, will erect a two-story addition 40 x 160.

The Illinois Alloy & Mfg. Co., South Dearborn Street, Chicago, has purchased the plant of the Standard White Metal Co., Elyria, Ohio, which recently went into the hands of a receiver, and will equip it for the manufacture of pistons, piston rings and bearings. An extension will be erected providing 22,500 sq. ft. of additional floor space. The officers are T. H. Reeves, president; V. A. Dorszeski, secretary and treasurer, and E. M. Williams, vice president and general manager.

The plant of the United Stamping & Machine Co., East 168th Street and Waterloo Road, has been purchased at receiver's sale by the bond holders, who have organized the Metal Stamping & Mfg. Co. with a capital stock of \$150,000. W. H. Kelly is president. The company will manufacture metal stampings.

Chicago

CHICAGO, Oct. 1.

SALES totals of Chicago machine tool merchants in September were the smallest of any month this year. As October opens, inquiries are more numerous, although actual orders are still few and far between. Many users have postponed their buying program until the first of next year and sales of new equipment are still impeded in various directions by offerings of used machinery. The equipment of the bankrupt Mitchell Motors Co. plant at Racine was recently put on the market. On the other hand, prospects for a resumption of railroad buying grow brighter. The large Burlington list has been completely tabulated and today was placed in the hands of the purchasing department with the likelihood that orders will ensue shortly. The Illinois Midland, a small railroad in this State, has purchased an 18-in. by 10-ft. engine lathe. The Sullivan Machinery Co., Michigan City, Ind., has closed for a 20-in. motor-drive shaper. The Burlington has ordered 10 floor grinders, these machines having been handled separately from the list aforementioned.

Among inquiries may be mentioned one from the U. S. Engineers Office, War Department, 537 South Dearborn Street, Chicago, which calls for a single quotation on a 15-in. pipe line dredge and the following tools: A 16 to 27-in. gap lathe, a 16-in. shaper, a 26-in. upright drill, a 12 x 2-in. emery grinder, a 2½-in. drill grinder, a 5-in. hack saw and a 30-in. grindstone. Schweitzer & Conrad, 4435 Ravenswood Avenue, Chicago, are in the market for two 20-in. or 24-in. drill presses with tapping attachment, a No. 2 Kempsmith or equivalent plain miller, and a No. 7 Foster hand screw machine, or equivalent. The Geuder, Paeschke & Frey Co., Milwaukee, is in the market for a straight-side double crank press, double geared with friction clutch, weighing 32,000 lb., opening in bed about 27 x 46 in., width between uprights about 54 in., stroke of slide 9 in. and 14 in. bed, one or two straight-side single-geared trimming presses weighing 10,000 lb., with 12 x 12-in. opening in bed, 20 in. or narrower between uprights, and three to four-in. stroke of slide; and one or two inclinable open back presses, weight about 6500 lb., not geared, with 3-in. stroke of slide, 10 to 11 in. die space, and a fly wheel weight of 1000 lb. The Pullman Co., Chicago, is inquiring for a double end punch with 18-in. depth throat to punch ¾-in. hole through ¾-in. plate.

The Whiting Corporation, Harvey, Ill., has taken orders for a No. 4 cupola from the Newman Foundry Co., Kendallville, Ind., and a No. 5 cupola from the Pittsburgh Valve & Fitting Co., Barborton, Ohio.

The Western Electric Co., Hawthorne, Ill., has leased from the Ashland Industries Corporation, Chicago, Building N and part of Building O of the former Symington gun

plant at Seventy-fourth Street, 200 ft. west of Ashland Avenue, Chicago, containing 160,000 sq. ft. of floor space. Fully 100,000 sq. ft. will be used for manufacturing purposes and the remainder will be occupied by the merchandise department. More than 1000 people will be employed.

Henry Newgard & Co., electrical contractor, 947 West Washington Boulevard, Chicago, is taking bids through an architect on a three-story factory, 75 x 118 ft., 125 South Morgan Street, Chicago, to cost \$90,000.

Fire recently damaged the plant of the Peerless Level Co. at Sterling, Ill.

The Falls Foundry Co., Cedar Falls, Iowa, has completed the foundation of a new foundry building, 70 x 120 ft.

The Michigan Seating Co., Jackson, Mich., is taking bids on construction of a five-story addition, 77 x 132 ft., to contain a power house.

The Toppins Tractor Truck Co., First National Bank Building, Chicago, recently incorporated, is manufacturing a truck chassis with a Fordson engine. At the present it is having its trucks manufactured by contract and is not in the market for metal working machinery. Officers are J. A. Morner, president; Ross D. Netherton, vice-president; B. F. Riplinger, second vice-president; P. D. Gates, secretary-treasurer.

The Superheater Co., 17 East Forty-second Street, New York, is preparing plans for an addition at East Chicago, Ind., 120 x 210 ft., to cost \$75,000.

The Western Fruit Express will build a car repair shop at St. Paul, Minn., to cost approximately \$150,000.

The Knickerbocker Case Co., Fulton and Clinton Streets, Chicago, is in the market for an alloy suitable for manufacturing trays, and is desirous of getting in touch with producers. Aluminum has been tried, but is not satisfactory.

The Reliance Electric Co., 1313 Moorman Street, Chicago, manufacturer of electrical equipment, has awarded a general contract to the Stoddard Peterson Co., 60 West Washington Street, for a two-story and basement addition, estimated to cost \$55,000. Edward Leiss is president.

The Williams Sealing Corporation, Decatur, Ill., manufacturer of metal bottle caps, bottle-capping machinery, etc., is disposing of a bond issue of \$150,000, a portion of the proceeds to be used for extensions. George A. Williams is president.

The Eagle Iron Works, 301 East Court Street, Des Moines, Iowa, will take bids for a new one and two-story foundry, 65 x 140 ft., estimated to cost \$50,000. At the same time, bids will be asked for a two-story pattern shop, adjoining, 61 x 65 ft., to cost about \$20,000. Work is now in progress on a two-story machine and structural shop, 80 x 275 ft., estimated to cost \$55,000, and equipment will soon be installed. The Canfield Engineering Co., 406 Flynn Building, is engineer. Theodore Aulman is head.

The Lane Oil Heat Mfg. Co., 111 Endicott Arcade, St. Paul, Minn., manufacturer of oil heating equipment, is planning for the erection of a new factory on site soon to be selected. John J. Lane is president.

The Webster Brothers Mfg. Co., Waucoma, Iowa, manufacturer of wooden boxes, cases, etc., is considering plans for a one-story factory at Mason City, Iowa, estimated to cost \$75,000. Machinery will be electrically-operated. N. A. Webster is president.

Manual training equipment will be installed in the two-story and basement high school to be erected at Carleton, Neb., estimated to cost \$90,000, for which plans are being prepared by Fiske & Meginnis, Bankers Life Building, Lincoln, Neb., architects.

The Pike Rapids Power Co., Little Falls, Minn., is planning the construction of a new hydroelectric generating plant at Pike Rapids, estimated to cost \$100,000, with machinery.

The National Plate Glass Co., General Motors Building, Detroit, has awarded a general contract to Jobst & Son, Lehmann Building, Peoria, Ill., for the initial units of its addition at Ottawa, Ill., operated in the name of the Federal Plate Glass Co., with power house, estimated to cost \$5,000,000 with equipment.

The Free Sewing Machine Co., Rockford, Ill., has tentative plans for rebuilding the portion of its factory destroyed by fire Sept. 14, with loss estimated at \$70,000 including equipment.

The National Crushed Stone Co., Sioux Falls, S. D., care of Chenaweth & Rettinghouse, Paulton Block, engineers, is contemplating the installation of a new stone-crushing plant to cost \$35,000, including machinery and power equipment.

The Union Drawn Steel Co., Beaver Falls, Pa., announces the appointment of the Milton Pray Co., with offices in the Monadnock Building, San Francisco, Bradbury Building, Los Angeles, and the L. C. Smith Building, Seattle, as Pacific Coast representative.

Milwaukee

MILWAUKEE, Oct. 1.

MACHINE tool plants in Milwaukee and in other production centers throughout Wisconsin are receiving an increasing number of orders, none of which is large but makes up a fair aggregate. The labor situation is still an aggravating one, and while in most cases the capacity required by current business is not nearly the maximum, it is extremely difficult to secure the skilled men needed. This condition, to a certain extent, is holding down foundries and machine shops, which are now getting better orders for immediate as well as future delivery. The Gisholt Machine Co. at Madison is advertising for lathe, planer and milling machine operators to handle a moderate accumulation of orders.

The B. F. Sturtevant Co., Hyde Park, Boston, is buying considerable new machinery for installation in its new Western center at Sturtevant, Racine County, Wis. It is now employing 100 operatives and expects to increase the number to at least 300 by Jan. 1. The foundry is being rehabilitated and will be placed in operation between Jan. 1 and Feb. 1. The Sturtevant works have orders amounting to more than \$500,000. H. W. Page is general manager at Sturtevant.

The Milwaukee Stamping Co., Sixty-fourth and Pullen Avenues, West Allis, Milwaukee, has increased its common stock from \$500,000 to \$600,000. It has no intention of making extensions immediately, but this is in prospect, due to the crowded condition of the plant. Small purchases of additional equipment are being made from time to time. August J. Petrie is president and general manager.

The Builders Veneer & Woodwork Co., Rio Creek, Wis., has let contracts for a veneer mill and factory, 50 x 120 ft., two stories, to be ready Dec. 1. Purchases of equipment are now being made. The original plant was destroyed by fire several weeks ago and all machinery was ruined. About \$65,000 will be invested in building and equipment. Matthew Bank is president and manager.

The Stanley Baggage Co., Stanley, Wis., has been incorporated with a capital stock of \$40,000 to manufacture trunks, suitcases, traveling bags and similar merchandise. It takes over an existing concern and plans to enlarge its factory, adding considerable new machinery, including facilities for making its own stampings and other metal parts. P. A. Fein, O. W. Henderson and S. F. Weber are the principal owners.

The Roberts Brass Co., Lincoln Avenue and Alexander Street, Milwaukee, has placed contracts for a one-story addition to its foundry and machine shop, estimated to cost \$25,000, including additional equipment.

The Green Bay Motor Car Co., 316 North Jefferson Street, Green Bay, Wis., will remodel its sales and service building and erect an addition to provide space for an extension of the machine shop. It will cost about \$30,000 complete. William H. St. John is principal owner.

The Gerke Concrete Block Co., Merrill, Wis., is erecting a two-story addition, 35 x 75 ft., and a power plant extension, 26 x 30 ft., one-story, and is buying miscellaneous equipment, including a new boiler.

William P. Schwartzburg, North Milwaukee, Wis., will enlarge the garage and service station at Hammond Avenue and Forty-third Street by a one-story addition, 60 x 80 ft., to be used largely for machine shop and service purposes. The investment will be about \$25,000.

The Lemm Electric Co., 3324 Fond du Lac Avenue, Milwaukee, will build a new electrical equipment repair and service shop, 30 x 68 ft., at 3404 Fond du Lac Avenue.

The Hoyer Engineering Co., 281 Grove Street, Milwaukee, contemplates the erection of a brick and steel machine shop, 50 x 120 ft., on a site to be selected shortly. Thomas Kotting is president and general manager.

Trustees of St. Agnes Hospital, 390 East Division Street, Fond du Lac, Wis., are preparing to build a two-story power plant and boiler house, 60 x 120 ft., and will purchase additional generating and boiler equipment, pumps, etc. The work is in charge of Schmidt, Garden & Martin, architects, 104 South Michigan Boulevard, Chicago.

The Danish Pride Milk Products Co., Sparta, Wis., plans a \$50,000 factory addition to quadruple its existing capacity and will require additional boilers, pumps, tanks, motors and other equipment. M. R. Frederickson is general manager.

The Board of Public Works, Fond du Lac, Wis., will take bids soon on a sewage ejector and other equipment for an addition to the pumping plant of the sewage disposal system. J. F. Hohensee is secretary.

The General Distributing Co., Appleton, Wis., has been capitalized at \$50,000 to deal in mill, factory and shop equipment, electrical appliances and devices, and general industrial machinery. The incorporators are F. F. Daneiko, D. J. Jacobson and Eva Daneiko.

The United States Engineer Office, Government Building, Milwaukee, is asking bids until Oct. 30 for the complete work of constructing a steel barge with derrick, for use in the Great Lakes district. The cost is estimated at about \$75,000.

Cincinnati

CINCINNATI, OCT. 1.

THE week showed a little more activity in the machine tool industry. Some fair-sized orders were booked, including a number of miscellaneous tools from a Michigan automobile manufacturer. Single tool orders were also received from the railroads, and at least one safe company in the district was a purchaser of a fair-sized list. While orders were scattered, the week was notable for a healthy increase in inquiries, a number of manufacturers reporting that they had quoted on more business the last week of the month than during all of the three preceding. Second-hand machinery dealers report a fair business, particularly in small tools.

Negotiations are in progress toward a reorganization of the Monitor Stove & Range Co., Cincinnati, which has been operating under a receiver for the past year. Plans provide for the purchase of the controlling interest of the present owners by a group of local business men.

The Cincinnati Industrial Investment Co., Cincinnati, has been incorporated with a capitalization of \$1,000,000 by local business men, to assist manufacturing plants in financing their business, and also to aid outside manufacturers in locating in Cincinnati. The company will cooperate with the industrial extension department of the Chamber of Commerce in securing new industries for the city.

W. M. Ginder, Columbus, Ohio, and associates, have purchased the patents and rights to manufacture time locks held by the Recording Devices Co., Dayton, Ohio, subsidiary of the R. L. Dollings Co., which recently went into bankruptcy. Mr. Ginder has as yet made no plans for manufacturing.

The Mitchell Engineering Co., Springfield, Ohio, manufacturer of polishing machinery, has increased its capitalization from \$10,000 to \$25,000 to provide additional equipment to expand its activities. J. A. Hynes is president.

The Dayton Fan & Motor Co., Dayton, Ohio, has leased two buildings adjoining its plant, giving an additional 20,000 sq. ft. of floor space, which will be utilized primarily in the manufacture of radio parts. Some new equipment has been purchased.

Manual training equipment will be installed in the new two-story high school to be erected at Nelsonville, Ohio, estimated to cost \$175,000, for which foundations will be laid at once. William Mills, Nelsonville, is architect.

Indiana

INDIANAPOLIS, OCT. 1.

PLANs are being completed for a one-story addition to the factory of the Rockwood Mfg. Co., 1801 English Avenue, Indianapolis, manufacturer of pulleys, transmission equipment, etc., to be 30 x 115 ft., estimated to cost \$75,000 including equipment. Motherhead & Fitton, 540 Meridian Street, are architects.

Fire, Sept. 22, destroyed a portion of the plant of the Amco Mfg. Co., 1022 East Michigan Street, Indianapolis, manufacturer of shock absorbers, automobile equipment, etc., with loss estimated at \$60,000 including equipment. It is planned to rebuild. William B. Paul is president.

The North Star Coal Co., 301 American Trust Building, Evansville, Ind., recently organized with a capital of \$100,000, is planning for the installation of electric power equipment, hoisting apparatus and mining machinery. L. C. Oliver is president.

The Standard Sanitary Mfg. Co., Bessemer Building, Pittsburgh, has acquired property at Pratt Street and Senate Avenue, Indianapolis, for a new two-story factory branch to cost \$55,000.

The La Salle Paper Co., South Bend, Ind., will take bids early in October for a new one-story and basement mill,

50 x 400 ft., at Mishawaka, Ind., estimated to cost \$100,000 with machinery. A new power house will also be erected. Freyermuth & Maurer, Farmers' Trust Building, South Bend, are architects. Claude N. Nicely is president.

The H. T. Electric Co., 612 North Capitol Avenue, Indianapolis, manufacturer of electrical equipment and supplies, will take bids in October for a one-story and basement addition, estimated to cost \$30,000. Edward D. Pierre, 321 Occidental Building, is architect.

The Indiana Reinforced Concrete & Culvert Co., 702 Morris Street, Indianapolis, has commenced the construction of a one-story plant, 90 x 120 ft., at 850 South Harding Street, to cost \$30,000. Additional equipment will be installed. E. S. Smith is head.

The Gulf States

BIRMINGHAM, OCT. 1.

FIRE, Sept. 21, destroyed the plant of the Hall Foundry & Machine Co., Jacksonville, Tex., with loss estimated at \$50,000 including equipment. It is planned to rebuild.

The J. E. Taylor Mfg. Co., San Antonio, Tex., has tentative plans for the establishment of a factory to manufacture children's vehicles, carts, etc. It is proposed to purchase wire and disk wheels in the outside market and the company is desirous of getting in touch with manufacturers. Local headquarters are at 1501 Travis Street.

The Great Southern Lumber Co., Bogalusa, La., has tentative plans for a new pulp mill in the vicinity of New Orleans, estimated to cost \$500,000 with machinery. A power house will also be built.

S. F. Dean, Finance Commissioner, Board of Prison Commissioners, State Penitentiary, Huntsville, Tex., will receive bids until Oct. 22 for machinery and tools for installation in the wagon plant at the institution, including automatic filing and setting band saw; vertical boring machine; iron bed wood-turning lathe; spoke facing machine; lag screw boring and driving machine; double spindle shaper; automatic double mortising and boring machine; double belt sander; wheel rim finishing machine; automatic spoke driver; heavy power feed rip saw; automatic axle lathe; automatic wheel boxing machine, and other tools, as per list on file.

Fire, Sept. 22, destroyed the refrigerating plant and other portions of the meat-packing factory of Swift & Co., Birmingham, with loss estimated at \$250,000, including machinery. It is planned to rebuild.

The Brown Paper Mill Co., Monroe, La., has placed contracts with the Chesapeake Iron Works, Westport, Baltimore, for traveling cranes for its new mill, and with the Reading Chain & Block Co., Reading, Pa., for several hand-operated cranes. Orders for additional equipment will be placed soon. Superstructure work on the plant has commenced and it is expected to be ready for service in the summer of 1924. The plant will cost about \$1,000,000 with machinery. George F. Hardy, 209 Broadway, New York, is architect and engineer. H. L. Brown is president.

The Snyder Utilities Co., Snyder, Tex., is completing plans for an ice-manufacturing and cold storage plant to cost \$50,000.

The United States Engineer Office, Mobile, Ala., will take bids until Oct. 8 for one extra heavy, three-side orange peel bucket and one extra heavy clamshell bucket.

Manual training equipment will be installed in the new high school to be erected at Denton, Tex., estimated to cost \$150,000, for which foundations will be laid at once. W. G. Clarkson & Co., First National Bank Building, Fort Worth, Tex., is architect.

A power house and refrigerating plant will be constructed by the Texas Packing Co., 110 Milan Street, Houston, Tex., in connection with its proposed five-story meat-packing plant, 56 x 118 ft., estimated to cost \$100,000. M. P. Burt, 206 Falls Building, Memphis, Tenn., is engineer.

The Atlantic Coast Line Railway Co., Wilmington, N. C., is completing plans for additions in its car and locomotive shops at Montgomery, Ala., estimated to cost \$500,000 including equipment.

The Bluff City Motor Co., Natchez, Miss., will install a machine shop in its new two-story service building, 95 x 125 ft., estimated to cost \$55,000. R. E. Bost, Natchez, is architect.

The Birmingham Water Works Co., Birmingham, is planning for extensions and improvements in its plants and system and will install electrically-operated pumping machinery, including a centrifugal unit of 2,000,000 gal. daily capacity at the Rosedale high service station, with auxiliary equipment.

The Gadsden Cooperage Co., Gadsden, Ala., has tentative plans for rebuilding its power house and portion of its plant recently destroyed by fire with loss estimated at \$45,000, including equipment.

The Peerless Motor Car Co., Cleveland, is perfecting plans for the establishment of a factory branch at Dallas, Tex. Temporary quarters have been leased on Commerce Street, and within the next six weeks removal will be made to a larger building on Main Street. Plans are now being drawn for a new building, with machine shop, service works and parts department, to cost \$75,000. George B. Gillespie will be one of the heads of the local branch.

The Common Council, Kenedy, Tex., plans the installation of electrically-operated pumping machinery in connection with extensions in the waterworks, estimated to cost \$30,000. John W. Thames is mayor.

Plans are under way for a reorganization of the Athens Ice Co., Athens, Tex., preparatory to the construction of a new ice-manufacturing and refrigerating plant to cost \$75,000. H. A. Drane is manager.

The Central South

ST. LOUIS, OCT. 1.

BIDS will soon be called by the United States Foil Co., 2934 Grand Avenue, Louisville, for the erection of a one-story foundry. O. P. Ward, Lincoln Trust Building, is architect. R. S. Reynolds is president.

The Dawson Daylight Coal Co., Louisville, recently organized, will commence the construction of a tippie near Dawson Springs, Ky. A mechanical washery will also be built, and electric power equipment, loading, conveying and other machinery installed. K. U. Meguire, Louisville, heads the company.

Manual training equipment will be installed in the new junior high school to be erected on Shartel Street, Oklahoma City, Okla., estimated to cost \$150,000, for which bids have been asked on a general contract. Layton, Smith & Forsyth, 701 Southwestern National Bank Building, are architects.

The Board of Education, Stillwater, Okla., has plans for a one-story manual training building at the local school. J. J. Patterson, Stillwater, is architect.

The Common Council, Herndon, Kan., has arranged a bond issue for the installation of a municipal electric plant and system. W. B. Rollins & Co., 521 Railway Exchange Building, Kansas City, Mo., is engineer.

The Kansas Electric Power Co., Leavenworth, Kan., is disposing of a bond issue of \$1,000,000, the proceeds to be used for extensions in generating plants and system and the installation of additional equipment.

Fire, Sept. 19, destroyed the plant of the Blytheville Compress & Warehouse Co., Blytheville, Ark., with loss estimated at \$400,000, including presses and other machinery. It is planned to rebuild.

The Common Council, Gallatin, Mo., is planning for the installation of additional equipment at the municipal electric power plant, including engine, motors and auxiliary equipment. C. W. Billings is manager.

Manual training equipment will be installed in the new high school to be constructed at Second and Bridge Streets, Frankfort, Ky., estimated to cost \$150,000, for which bids will soon be asked on a general contract. Frank L. Packard, 1212 Hayden Building, Columbus, Ohio, is architect.

The Drakesboro Coal Co., Mogg, Ky., recently organized with a capital of \$400,000, is planning the installation of electric power equipment, hoisting, and other coal-mining machinery on local properties. Claude Nichols, Mogg, and Edgar Nichols, Central City, Ky., head the company.

The Duncan Machinery Co., P. O. Box 265, Knoxville, Tenn., machinery dealer, has inquiries out for an automatic saw sharpener for circular saws up to about 64 in. in diameter.

The Common Council, Thayer, Mo., is planning the installation of electrically-operated pumping machinery in connection with a new waterworks plant estimated to cost \$55,000. A special election has been called to vote bonds.

The M. & F. Light & Power Co., Flemingsburg, Ky., recently organized, is planning for extensions in power house and system, lately acquired, including the installation of additional equipment for service at Flemingsburg, Maysville and vicinity.

The Wilson Milling Co., Wilson, Ark., is planning the installation of an oil-operated engine, generator and auxiliary equipment at its power house, estimated to cost \$30,000.

The American Brake Shoe & Foundry Co., McCormick Building, Chicago, will take bids for the initial units of its proposed plant at North Kansas City, Mo., consisting

of a foundry, sand and cleaning shop, and machine and repair shop, estimated to cost \$300,000 with equipment. Thomas Finigan, vice-president, is in charge.

The Common Council, Holdenville, Okla., plans the installation of electrically-operated pumping machinery in connection with extensions in the municipal waterworks, estimated to cost \$50,000.

The Canadian Valley Utilities Co., Drumright, Okla., has tentative plans for extensions in its electric plant and system. The company recently increased its capital to \$150,000.

Revised plans are being drawn for the new factory branch to be erected by the Westinghouse Electric & Mfg. Co., East Pittsburgh, on Milwaukee Avenue, Kansas City, Mo., to cost in excess of \$90,000, for which bids will soon be asked on a general contract. P. H. Anthony, 1108 Waldheim Building, is architect. Local offices of the company are in the Orear-Leslie Building.

Canada

TORONTO, OCT. 1.

DEMAND for machine tools was slightly stronger the past week and sales of one or two machines to a customer reached a good volume. Large lists, however, are still absent from the market, although inquiries for equipment for several plants have recently made their appearance. The automobile industry is constantly entering the market for tools, the pulp and paper industry has been a factor in the steady improvement, and several plants are to be erected in Canada during the next few months which will help to stimulate the demand. Mining interests are making important inquiries and machinery interests look for an active demand for this class of equipment throughout the fall and winter.

The Standard Paper Box Co., 2724 Park Avenue, Montreal, is in the market for an 80 hp. boiler.

The Laurentian Timber Products Co., St. Jerome, Que., is building a plant to cost \$25,000. J. Coderre, 6331 St. Charles Street, Montreal, is receiving prices on sawmill equipment.

T. E. Bissell Co., Elora, Ont., is building an addition to manufacture agricultural implements and is in the market for machinery and tools.

The Yorkshire Wool Stock Mills Co., Almonte, Ont., will spend about \$50,000 on new machinery to replace that recently damaged by fire.

The Victoria Lumber & Mfg. Co., Chemainus, B. C., is having plans prepared for a boiler house to house seven boilers generating 4600 hp., and to cost \$30,000.

L. Villeneuve & Co., 2599 St. Lawrence Boulevard, Montreal, is in the market for band saw and other equipment for a sash and door factory. M. Paquette is purchasing agent.

The Boake Mfg. Co., Dartnell Avenue, Toronto, proposes to erect a woodworking factory to cost \$150,000. It is inquiring for prices and information on sash and door machinery, including planers, saw and tenon machines.

J. S. Sutherland, Dayton, Ohio, is preparing plans for a pulp mill to be erected at Winnipeg, Man., to have a daily capacity of 100 tons and cost approximately \$1,250,000.

The Hollinger Consolidated Gold Mines, Timmins, Ont., is receiving bids for the construction of buildings in connection with a power development project and will soon be in the market for switchboards, series transformers, meters, etc.

The Harbor Commissioners, Quebec, have called for bids for the construction of a power plant and cold storage warehouse. Tenders for the machinery and equipment will be called separately.

Work has been started on a power plant for the village of Port Elgin, N. B., for which \$9,000 worth of equipment will be required.

The Town Council of Jonquiere, Que., is erecting a hydro-electric power development plant at a cost of \$75,000 and will install 1500 and 1800 hp. turbines. J. M. Lacroix is clerk. J. F. Grenon, Cincinnati, Que., is engineer.

The Dominion Creosoting & Lumber Co., South Vancouver, B. C., will start work soon on the erection of a mill and creosoting plant on River Road, to cost \$250,000.

Belleville, Ont., will call for bids at an early date for a gasoline driven pump approximately 3,000,000 gal. capacity; also pumping station building to cost \$25,000. Gore, Nasmith & Storrie, Toronto, are engineers.

The Yellow Fir Lumber Co., Sathlam, B. C., whose plant was recently destroyed by fire will rebuild immediately at a cost of \$50,000.

The Dominion Wheel & Foundries, Ltd., 131 Eastern Avenue, Toronto, will build an addition and bulk tenders are being received by S. J. Nell, manager.

The Beaver Truck Co., Hamilton, Ont., will erect two factory buildings at Brampton, Ont., to cost \$150,000. It has secured a 5 acre site and the buildings will be 100 x 350 ft. and 70 x 120 ft., respectively, of steel and concrete. Automobile trucks will be manufactured.

It is reported that plans have been completed and construction will start immediately on the power development project at Bryson, 50 miles above Ottawa, for the Ottawa River Power Co. It is a subsidiary of the Ottawa & Hull Power Co., and owns a site at Bryson. Work on the transmission line to Ottawa is expected to be completed this month.

The Pacific Coast

SAN FRANCISCO, SEPT. 26.

WORK will commence on a branch plant on Seventy-eighth Avenue, Oakland, Cal., for the Victor Talking Machine Co., with headquarters at Camden, N. J., to be two-stories estimated to cost \$100,000 with equipment. William Knowles, Central Bank Building, Oakland, is architect.

The Union Rock Co., Azusa, Cal., operating a quarry and rock crushing works, has plans for additions estimated to cost \$50,000, exclusive of machinery. The equipment will comprise electric power apparatus, crushing machinery, etc., and will cost approximately a like amount.

The Western Vacuum Ice Co., 235 Montgomery Street, San Francisco, has preliminary plans for a new ice-manufacturing plant to be one-story, 65 x 110 ft., with extension, 35 x 75 ft., estimated to cost \$100,000 with machinery. Henry W. Meyers, Kohl Building, is architect. E. W. Crellin is head.

The Common Council, Aberdeen, Wash., is considering plans for a municipal hydroelectric power plant on the Wynooche River, estimated to cost \$2,000,000 with transmission system.

The City Council, Clarkson, Wash., is planning for the installation of electrically-operated pumping machinery in connection with new municipal waterworks estimated to cost \$300,000, for which bonds are being arranged.

The Grinnell Co., 453 Mission Street, San Francisco, manufacturer of fire extinguishers, etc., has awarded a general contract to the Austin Co., Santa Fe Building, for a one and two-story plant, 90 x 240 ft., at Fifth and Brannan Streets, to cost \$80,000.

The Automatic Cain Lock Machine Co., 340 Sansome Street, San Francisco, is planning to remove its plant to a building on Folsom Street where additional equipment will be installed.

Fire, Sept. 21, destroyed a portion of the power plant of the Great Western Power Co., Crockett, Cal., with loss estimated at \$100,000, including equipment. It will be rebuilt. Headquarters of the company are at 14 Sansome Street, San Francisco.

The Southern California Edison Co., Los Angeles, will commence the construction of a new storage and distributing plant on a 25-acre site at Alhambra, Cal., to consist of eight individual units, 200 x 500 ft., 80 x 400 ft., 120 x 260 ft., and smaller. One building will be equipped as a machine shop. Electric traveling cranes will be installed, as well as hoisting, loading and conveying machinery. The works are estimated to cost \$8,000,000 with equipment.

The California Oregon Power Co., Klamath Falls, Ore., is disposing of a bond issue of \$1,000,000, a portion of the proceeds to be used for the purchase of the Douglas County Light & Water Co., Roseburg, Ore., and for extensions in power plants and system.

The Pacific Spring Bed Co., 2331 Fourth Street, Berkeley, Cal., is arranging to remove its plant to a larger building at 800 High Street, Oakland, Cal., where additional machinery will be installed.

The Pelton Water Wheel Co., Nineteenth and Florida Streets, San Francisco, will commence the erection of a two-story addition, estimated to cost \$100,000 including machinery. W. W. Hanscom, 848 Clayton Street, is engineer.

The Rockford Milling Machine Co., Rockford, Ill., has appointed the Millholland Sales & Engineering Co., 540 Consolidated Building, Indianapolis, as exclusive distributor in Indiana for Rockford milling machines and Sundstrand lathes.

The Valley Rolling Mills, Inc., will move its executive and sales offices from 50 Church Street to 120 Broadway, New York.

Steel and Industrial Stocks

The range of prices in active steel and industrial stocks from Monday of last week to Monday of this week was as follows:

	Low	High		Low	High
Allis-Chalmers...	40	41	Int. Har. new...	73 1/2	76 1/2
Allis-Chalm. pf...	90	90 3/4	Lima Loco.	62 1/2	65 1/2
Am. B. S. & Fdy. 70	71	71	Midvale Steel....	25 1/2	26
American Can... 89 1/2	93	93	Nat.-Acme	8 1/2	10 1/2
American Can pf. 107	107 3/4	107 3/4	Nat. En. & Stm. 52 1/2	56	56
Am. Car & Fdry. 153 1/2	157	157	N. Y. Air Brake. 36	36 3/4	36 3/4
Am. Locomotive. 68 1/2	70 1/2	70 1/2	Nova Scotia Stl.. 16	17 1/2	17 1/2
Am. Loco. pf... 115 1/2	115 1/2	115 1/2	Ot's Steel	7 3/4	7 3/4
Am. Radiator... 80	81 3/4	81 3/4	Ot's Steel pf....	49 1/2	49 1/2
Am. Steel Fdries. 35	35 3/4	35 3/4	Pressed Stl. Car 48 1/2	50	50
Am. S. Fdries. pf. 100	100	100	Ry. Steel Spring. 101	102	102
Baldwin Loco... 112 1/2	116 1/2	116 1/2	Replogle Steel... 10	11 1/2	11 1/2
Bethlehem Steel. 46 3/4	49	49	Republic	42 1/2	44 1/2
Beth. pf. new... 91 3/4	92	92	Republic pf....	87	87
Beth. Stl. 8% pf. 105	106	106	Sloss	42	43 1/2
Br. Em. Steel... 5 3/4	5 3/4	5 3/4	Superior Steel... 24	25	25
Br. Em. Stl. 1 pf. 58 3/4	59 3/4	59 3/4	Superior Stl. pf. 100	100	100
Br. Em. Stl. 2 pf. 16 1/2	16 1/2	16 1/2	Transue-Williams 31 1/2	31 1/2	31 1/2
Chic. Pneu. Tool 81	81 3/4	81 3/4	United Alloy Stl. 30	30 1/2	30 1/2
Colo. Fuel	26	26 3/4	U. S. Pipe	30 1/2	33 1/2
Crucible Steel... 57 1/2	61	61	U. S. Pipe pf....	77 3/4	78 3/4
Crucible Stl. pf... 86	87	87	U. S. Steel	85 3/4	88 1/2
Gen. Electric... 168	170	170	U. S. Steel pf... 116 3/4	118 1/2	118 1/2
Gt. No. Ore Cert. 26 1/2	27 3/4	27 3/4	Vanadium Steel. 28 3/4	29 3/4	29 3/4
Gulf States Steel 73 1/2	78 3/4	78 3/4	Whouse Air Br. 81 3/4	81 3/4	81 3/4
Inland Steel.... 33 1/2	35 1/2	35 1/2	Ygstown S. & T. 65	66 1/2	66 1/2
Inland Stl. 1 pf. 101 1/2	101 1/2	101 1/2			

Industrial Finances

The Iron Products Corporation reports for the six months ended June 30 net income after all charges but before Federal taxes of \$1,003,964, equivalent after preferred dividends to \$6.84 per share on the 140,854 common shares outstanding. Surplus for the period was \$964,472.

Net earnings of the Penn Seaboard Steel Corporation for the seven months ended July 31, after interest charges, expenses and proportion of profit applicable to minority holdings, were \$59,819. Output of all plants during the period was 23,205 tons. Extended voting trust certificates for 913,272 shares of capital stock are now authorized to be listed on the New York Stock Exchange.

Plans for refinancing the Hydraulic Steel Co., Cleveland, were discussed at a meeting of the representatives of stock and note holders, Sept. 29, and a committee was appointed to formulate such plans. The meeting was attended by three representatives of the 8 per cent note holders, three of the preferred stockholders and a representative of a security house. The company's financial condition has improved materially recently. It has earned more than the note interest for the last five months but is \$1,000,000 in arrears in preferred stock dividends, and the adoption of some financing plan is needed to provide additional working capital.

The Superior Steel Corporation for the six months ended June 30, last, reports net income of \$474,247 after expenses and Federal taxes. Net sales totalled \$4,664,880. President R. E. Emery said that orders have increased considerably during September. Cold rolled mills are operating at practically 100 per cent but hot rolled mills are running at about 70 per cent of capacity.

The Harrington & King Perforating Co., Chicago, has moved to 5657 Fillmore Street, where it will occupy a new factory. Additional equipment has been installed which will increase capacity considerably.

After Oct. 1, the Michigan office of the Truscon Steel Co. will be located in the new building at 615 Wayne Street, Detroit. The office includes a complete service organization and engineering department. The general advertising department of the company will be located on the same floor with the Michigan office.

New Books Received

Fundamentals of Welding Gas, Arc and Thermit. By James W. Owens. Pages 659, 6 x 9 in.; illustrations 279. Published by Penton Publishing Co., Cleveland. Price, \$10.

Cost Control for Foundries. By Frank Everitt and Johnson Heywood, of Miller, Franklin, Basset & Co. Edited by William R. Basset. Pages 226, 6 x 9 1/4 in.; illustrations 72. Published by McGraw-Hill Book Co., Inc., 370 Seventh Avenue, New York. Price, \$3.

American Society for Testing Materials. A. S. T. M. Standards adopted in 1923. Pages 126, 6 x 9 in.; illustrated. Published by the American Society for Testing Materials, 1315 Spruce Street, Philadelphia.

Kent's Mechanical Engineers' Handbook. By Robert T. Kent, editor-in-chief. Pages 2247, 4 1/2 x 7 in., illustrated. Published by John Wiley & Sons, Inc., 432 Fourth Avenue, New York. Price, \$6.

Current Metal Prices

On Small Lots, Delivered from Merchants' Stocks, New York City

The following quotations are made by New York City warehouses.

As there are many consumers whose requirements are not sufficiently heavy to warrant their placing orders with manufacturers for shipments in carload lots from mills, these prices are given for their convenience.

On a number of items the base price only is given, it being impossible to name every size.

The wholesale prices at which large lots are sold by manufacturers for direct shipment from mills are given in the market reports appearing in a preceding part of THE IRON AGE under the general heading of "Iron and Steel Markets" and "Non-Ferrous Metals."

Iron and Soft Steel Bars and Shapes

Bars:	
Refined iron bars, base price	3.54c.
Swedish charcoal iron bars, base	7.25c.
Soft steel bars, base price	3.54c.
Hoops, base price	5.19c.
Bands, base price	4.39c.
Beams and channels, angles and tees, 3 in. x ¼ in. and larger, base	3.64c.
Channels, angles and tees under 3 in. x ¼ in. base	3.54c.

Merchant Steel

	Per Lb.
Tire, 1½ x ½ in. and larger (Smooth finish, 1 to 2½ x ¼ in. and larger)	3.60c. 4.10c.
Toe-calk, ½ x ¾ in. and larger	4.60c.
Cold-rolled strip, soft and quarter hard	7.50c. to 8.50c.
Open-hearth, spring-steel	5.00c. to 7.50c.
Shafting and Screw Stock:	
Rounds	4.65c.
Squares, flats and hex.	5.15c.
Standard tool steel, base price	15.00c.
Extra tool steel	18.00c.
Special tool steel	23.00c.
High speed steel, 18 per cent tungsten	75c. to 80c.

Tank Plates—Steel

¼ in. and heavier	3.64c.
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Sheets

	Per Lb.
<i>Blue Annealed</i>	
No. 10	4.59c.
No. 12	4.64c.
No. 14	4.69c.
No. 16	4.79c.

Box Annealed—Black

	Soft Steel C. R., One Pass Per Lb.	Blued Stove Pipe Sheet Per Lb.
Nos. 18 to 20	4.55c. to 4.80c.	.....
Nos. 22 and 24	4.60c. to 4.85c.	5.10c.
No. 26	4.65c. to 4.90c.	5.15c.
No. 28	4.75c. to 5.00c.	5.25c.
No. 30	4.95c. to 5.20c.	.....
No 28 and lighter, 36 in. wide, 20c. higher.		

Galvanized

	Per Lb.
No. 14	4.85c. to 5.10c.
No. 16	5.00c. to 5.25c.
Nos. 18 and 20	5.15c. to 5.40c.
Nos. 22 and 24	5.30c. to 5.45c.
No. 26	5.45c. to 5.70c.
No. 27	5.60c. to 5.85c.
No. 28	5.75c. to 6.00c.
No. 30	6.20c. to 6.50c.
No. 28 and lighter, 36-in. wide, 20c. higher.	

Welded Pipe

Standard Steel		Wrought Iron	
Black	Galv.	Black	Galv.
½ in. Butt..	—41 —24	½ in. Butt..	— 4 +19
¾ in. Butt..	—46 —32	¾ in. Butt..	—11 + 9
1-3 in. Butt.	—48 —34	1-1½ in. Butt	—14 + 6
2½-6 in. Lap.	—44 —30	2 in. Lap.....	— 5 +14
7-8 in. Lap..	—41 —11	2½-6 in. Lap	— 9 + 9
9-12 in. Lap.	—34 — 6	7-12 in. Lap.	— 3 +16

Steel Wire

	Per Lb.
Bright basic	5.00c.
Annealed soft	5.00c.
Galvanized annealed	5.65c.
Coppered basic	5.65c.
Tinned soft Bessemer	6.65c.

*Regular extras for lighter gage.

Brass Sheet, Rod, Tube and Wire

BASE PRICE

High brass sheet	18 c. to 19 c.
High brass wire	18½c. to 19½c.
Brass rods	15½c. to 16½c.
Brass tube, brazed	26 c. to 27½c.
Brass tube, seamless	23 c. to 24 c.
Copper tube, seamless	24½c. to 25½c.

Copper Sheets

Sheet copper, hot rolled, 21¼c. to 22¼c. per lb. base.

Cold rolled, 14 oz. and heavier, 3c. per lb. advance over hot rolled.

Tin Plates

Bright Tin	Grade	Grade	Coke—14 x 20	Prime	Seconds
	"AAA"	"A"	80 lb..	\$6.55	\$6.30
	Charcoal	Charcoal	90 lb..	6.65	6.40
	14x20	14x20	100 lb..	6.75	6.50
IC..	\$12.55	\$10.70	IC..	7.00	6.75
IX..	13.95	12.55	IX..	8.25	8.00
IXX..	15.55	13.75	IXX..	9.50	9.25
IXXX..	17.10	15.30	IXXX..	10.75	10.50
IXXXX..	18.85	16.80	IXXXX..	12.00	10.75

Terne Plates

8 lb. coating, 14 x 20	
100 lb.	\$7.00 to \$8.00
IC	7.25 to 8.25
IX	8.25 to 8.75
Fire door stock	9.00 to 10.00

Tin

Straits pig	44c.
Bar	49c. to 56c.

Copper

Lake ingot	16½c.
Electrolytic	16¼c.
Casting	16 c.

Spelter and Sheet Zinc

Western spelter	7½c.
Sheet zinc, No. 9 base, casks	10½c. open 11c.

Lead and Solder*

American pig lead	8¼c. to 8½c.
Bar lead	11c. to 12c.
Solder ½ and ½ guaranteed	31c.
No. 1 solder	29c.
Refined solder	25c.

*Prices of solder indicated by private brand vary according to composition.

Babbitt Metal

Best grade, per lb.	75c. to 90c.
Commercial grade, per lb.	35c. to 50c.
Grade D, per lb.	25c. to 35c.

Antimony

Asiatic	9c. to 9½c.
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Aluminum

No. 1 aluminum (guaranteed over 99 per cent pure), in ingots for remelting, per lb.	34c. to 35c.
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Old Metals

The market continues dull and values are slightly off. Dealers' buying prices are nominally as follows:

	Cents Per Lb.
Copper, heavy crucible	11.75
Copper, heavy wire	11.25
Copper, light bottoms	9.50
Brass, heavy	6.00
Brass, light	5.00
Heavy machine composition	9.00
No. 1 yellow brass turnings	6.50
No. 1 red brass or composition turnings	7.75
Lead, heavy	6.00
Lead, tea	5.00
Zinc	4.25
Cast aluminum	15.00
Sheet aluminum	15.00